TWO MODES OF REAL LIFE HOMEWORK AND PUPILS' LEARNING OUTCOMES IN BASIC SCIENCE IN ABEOKUTA, NIGERIA

BY

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ABSTRACT

Basic science is taught in primary schools to develop pupils' capacity for critical thinking and scientific attitude among others. However, studies show that primary school pupils exhibit poor scientific attitude and low achievement in basic science in Abeokuta, Nigeria. Previous studies focused more on factors influencing pupils' learning outcomes with little emphasis to interventions of homework modes. This study, therefore, was carried out to determine the effects of two modes of homework [Interactive Real Life Homework (IRLH) and Non-interactive Real Life Homework (NIRLH)] on pupils' learning outcomes (achievement and scientific attitude) in basic science in Abeokuta, Nigeria. The moderating effects of parents' socio-economic status and school type were also examined.

Cognitive Development Theory provided the framework, while the pre-test–post-test control group quasi-experimental design with a 3x2x2 factorial matrix was adopted. Simple random sampling technique was used to select one Local Government Area (LGA) Abeokuta South from the existing two LGAs that make up Abeokuta city. Stratified random sampling was used to select three public and three private primary schools. Primary six was purposively chosen because it is the terminal class, which marks the completion of primary education. Six intact classes (one per school) were randomly assigned to interactive real life (90 participants), non-interactive real life (85 participants) and control (61 participants) groups. Instruments used were Basic Science Achievement Test (r = 0.75), Scientific Attitude Questionnaire (r = 0.88), Pupil's Participation in Homework questionnaire (r = 0.79) and instructional guides. Data were analysed using Analysis of covariance and Scheffe's post-hoc test at 0.05 level of significance.

The pupils from private schools' mean age was 9.5 ± 0.5 years, whiletheir counterparts from public schools was 11.0 ± 0.7 years. There was a significant main effect of treatment on pupils' achievement in basic science $F_{(2, 223)} = 4.37$; partial $\tilde{\eta}^2 = 0.04$). Pupils exposed to IRLH had the highest achievement mean score (14.11), followed by NIRLH (14.09) and control (12.66) groups. There was no significant main effect of treatment on scientific attitude. The main effect of school type was significant on scientific attitude ($F_{(1, 223)} = 7.50$; partial $\tilde{\eta}^2 = 0.04$). Pupils in public schools had higher scientific attitude mean score (13.87) than their counterparts in the private schools

(12.79). There was a significant two-way interaction effect of parents' socio-economic status and school type on scientific attitude ($F_{(1,223)} = 4.53$; partial $\tilde{\eta}^2 = 0.05$) whereby, pupils from low socio-economic status had higher attitude mean scores in IRLH. There were no three-way interaction effects of treatment, parents' socio-economic status and school type on achievement in and scientific attitude to basic science.

Interactive and non-interactive real life homework were effective in enhancing primary pupils' achievement in and attitude towards basic science in Abeokuta, Nigeria regardless of parents' socio-economic status. Primary school teachers should therefore, adopt these modes of homework for improved achievement in basic science and development of positive scientific attitude.

Keywords: Homework modes, Achievement in and attitude to basic science, School types, Parents' socioeconomic status, Interactive real life homework.

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DEDICATION

To Almighty God, the giver of life and source of wisdom and inspiration.

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CERTIFICATION

We certify that this work was carried out by **Olufunmilayo Olubunmi SORETIRE** (Matric No.: **102188**) in the Department of Early Childhood and Educational Foundations, University of Ibadan, Nigeria.

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CHAPTER 1

INTRODUCTION

1.1 Background to the Study

Science and technology stand out as the hallmark of civilization and key contributorsto national growth. Both are required in solving the myriad of challenges confronting the world today. The extent ofdevelopment, adoption and utilization of science and technology is the difference between underdeveloped and developing nations. Consequently, for the development of any nation, top priority should be given to learning and teaching of science in schoolsright from the basic classes which serveas the foundation(Afolabi, 2013).The Federal Government of Nigeria,in realization of education as an essentialinstrument for the growth and development of the individual, society and the nation, acknowledgeseducation in the National Policy on Education as an instrument par excellence for producing national development (Federal Republic of Nigeria,2013).

Primary education is the basis of formal educationand a necessity for every child for the transformation of the society (Afolabi, 2013; Opoh, Okou and Ubung, 2014). It should provide the learner with opportunities to: acquire literacy, numeracy, creativity and communication skills. One of the roles of primary education is to ensure the all-round development of pupils. This means ensuring that all pupils develop their cognitive, social, emotional, cultural and physical skills to the best of their abilities while preparing them for their further schooling career.It is the gateway to all higher levels of education that prepare scientists, teachers, doctors and other highly skilled professionals that every country no matter how small or poor requires (Bruns, Mingat and Rakotomalala, 2003). It is the level of education that develops in the individual the capacity to read, write and calculate (Akinbote, 2007; Babalola, 2010). It is also the potent level of education that helps in the eradication of illiteracy which is the strongest predictor of poverty and inequality globally (Weikart, 2000). The successful completion of primary education increases the productivity of the individual, labour force, the

potential for knowledge driven economic development and adequate utilisation of both human and material resources of a nation (Bruns et al, 2003).

As the basis of our education, a solid background in science is necessary. Pupils should be promptedto learn and enjoy science by their first formal educational encounter with the subject in the elementary classes (Wellcome Trust, 2014). As Murphy and Beggs (2005) reported in their extensive research report,following a survey of primary schools in UK, that primary science has the tendency to trigger children's interest in the sciences, as it offers the opportunity to enhancetheir natural curiosity.Science classes should, therefore,provide pupils with opportunities toask questions,hypothesise,manipulate materials, predict and examine their predictions. Pupilsshould be encouraged to develop their own investigations in an active learning environment. Primary science should build up pupils' understanding of the world and teach crucial skills including observation, enquiry, analysis, prediction and reasoning.Primary schoolpupilsshould be taught stimulating science that builds their understanding of the value and place of science in their lives (Murphy and Beggs, 2005). This will enable them to make intelligent decisions, at the foundationfor their studiesand give them an edgeinvarieties of rewarding careers(Wellcome Trust, 2014).

Science education is structured specifically towards meeting the needs of the society. Irrespective of one's occupation, science plays major roles in everyone's life; thus making itan indispensable feature of modern society (Movahedzadeh, 2011). The significance of science and technology in the global modernization process is now being emphasizedto a greater extent than before; and as such, science education needs to be more functional. Studies, however, revealed that science classes in our primary schools encourage rote learning rather than pupils finding out facts and forming concepts by themselves;this makes educationfunctional (Opara and Etukudo, 2014) and brings to the fore, the need fora more interactive way of learning science through the use of real life experiences.Society,especially educators, should therefore, seek ways of improving the scientific attitude of pupils and train them to live in a modern and highly sophisticated technological society. Every country's future will be formed by nationals who are able to realizethe inter-connected and complicatedeffects of science and technologyon our world (Ungar, 2010; Narmadha and Chamundeswari, 2013).

The knowledge of science is used in the production of materials that reduce stress, suffering and hunger, protects as well as make life more enjoyable and secure. This implies that, for any significant national growth and development to be attained, science and technology must be crucial requirements of the nation's culture (Adeyemo, 2005andOpara, 2014). Scientific knowledge as the basis of technology should be formulated early at the primary school in order to instilscientific abilities in pupils right from childhood (Aluko and Aluko, 2008). Primary school science gives every child the basic knowledge and understanding of concepts and principlesthat will form the foundation for further study of science in the secondary school andtertiary institutions.

The subject, basic science and technology, plays a majorrolein the Nigerian education programme, as it preparespupils at the primary and junior secondary school levels for the further learning of science subjects at the senior secondary school level.This invariably sparks up students' curiosity and interest in science related courses at the tertiary institutions (Oludipe and Oludipe, 2010; Narmadha and Chamundeswari, 2013). Though, students often learn science throughfacts disclosed by others,they should learn sciencethrough direct participationand investigationby actively manipulating things in their environment, asking questions, trying out things, recording observations and seeking to understand (Wilson, 2007). Relevance and functionality are major considerations for teaching and learning basic science and technology (Opara and Etukudo, 2014), as they relate the child to the environment and develop inquisitiveness and skills that link the discovery of scientific concepts to their applications. This is one of the premises on which this research work stands.

Young children are naturally curious and passionate about learning. They are inquisitive by nature with inclination to learn everything they see around them. When children's natural desire to explore the world in which they live are supported, their scientific mind is gradually developed. Encouraging children to be curious about the natural world and asking them questions that foster that curiosity allows them to appreciate and love science.For pupils to be curious, they must feel worthy of seeking. They must be encouraged to ask questions,to stray, to explore and to seek.Curiosity has been acclaimed the major impulse behind cognitive development, learning and scientific discovery (Loewenstein, 1994). It is the drive that leads to knowledge. Curiosity is about being aware and open, checking things out, experimenting and interacting with one's

surroundings. Thecuriosity, which starts from the home, is then reinforced in the school to aid better performance in the science class.

Attitude is important, not only in understanding science andenhancing pupils' achievement,but also in their involvement in science related careers (Anwer, Iqbal and Harrison; 2012). Attitudes are learned responses, stemming from various influences children come in contact with (Inouye, 2012) through interactions with their teachers in school, parents at home or cartoon depictions of scientists (Buldu,2006; Inouye, 2012).Scientific attitudes should be developed early in the primary schools, as negative conceptions of science begin in the late primary classes and may lead to a turn down inpupils' attitudes toward science in junior and senior secondary schools(Murphy and Beggs, 2003; Murphy and Kilfeather 2011). Similarly,Bartley, Mayhew and Finkelstein(2009) as well asMaltese and Tai(2010) also found out that future interest in science and science careers began early in the primary school. Those with careers in science-related fields reported the influence of developing science at an early age. Thus, it becomes crucial for teachers to promote pupils' interest in science asattitudes developed at an early age have major influenceson future behaviors.Inouye (2012) credited children's positive attitudes toward science learning to early exposure to practical experimentation.

The importanceof primary science lies in its ability to actuate the interest of pupils in the sciences. During science classes,avenues should be created for children to ask questions, hypothesize, predict andtake control of materials being used. Regrettably, these are not achieved in primary science classrooms nowadays.Every year, primary schools produce graduates whose scientific attitudes are not well developed and who cannot meet up with current trends in junior secondary school science. This leads to low achievement in science and a decline of interest in science subjects (Opara and Etukudo,2014). Efforts by Nigerian government over the years towards encouraging the study of scienceare not yielding the necessary outcome. Ali and Awan(2013); Oludipe and Oludipe (2010) andNarmadhaand Chamundeswari (2013) observed a poor attitude towards science which was largelyinduced by teachers' method of teaching basic science.

Several researches are investigating the decline in the number of studentsengaging in scientific careers(Osborne, 2003; U.S Department for Education,1994; 2006).Therefore;

the promotion of favourable scientific attitudes is worth looking into. Hence, extensive efforts need to be exerted to improve science achievement from the elementary school.

Akindele (2013), observed that, in Nigeria, basic science and technology is a subject that has been made compulsory in the primary classes. Before the advent of Universal Basic Education (UBE), primary six pupils sat for a general examination in their final year in primary classes but with UBE, the primary six school leaving certificate examination has been scrapped. Primary six school leavers are promoted en masse to the nearestpublic secondary schools in their neighbourhood (federal government colleges and unity schools not inclusive).George(2006); Saracho and Spodek(2008) reported that at the primary school level, teachers use mainly the lecture mode of teaching pupils with little or no time for hands-on activities and practical classes. Curiosity and critical thinking over time become low,pupils have a passive attitude in science classes and preferlearning by rote. This decline of interest culminates in poor scientific attitude as shown in the number of students that enrol in science classes in the senior secondary school in contrast to those going in for arts and commercial subjects. Many students run to arts class because they feel science is difficult to understand possibly because their interest and attitude which were supposed to have been developed early from the primary school were jeopardised. The results of national junior and senior secondary school certificate examinations attest to low achievement in science (Afolabi, 2013).

Oludipe and Oludipe(2010) traced the poor achievement of pupils in science subjects at thejunior and seniorsecondary schoolcertificate examinationsto poor attitudes to science in the primary classes.Other causes are the rigid science curriculumcontents, the perceived difficulty of primary science;inadequate and poor science teaching; home and societal factors (Bartley, Mayhew and Finkelstein, 2009).Bennett (2003) identified other causes of poor achievement in science in primary schools as non-science teachers teaching science subjects; shortage of science teachers; negative attitude of pupils to science subjects; teachers lack of competence and confidence in teaching science and inability to balance thetheoretical knowledge with promoting practical skills. All these call for further research by educators and greater concern by parents, government and other stakeholders in finding lasting solutions. Numerous studies on how to improve pupils' achievement in science are yet to yield positive results mainly because of the use of inappropriate and non-effective teaching methodology(Van Voorhis, 2000; Tsai, 2006 and Ogbeba, 2009).

Osuafor (2008) also reported thatsecondary schoolstudents' performancein science subjects has consistently remained low despite different researches focused on strategies to improve the teaching and learning of the subjects (Oludipe and Oludipe, 2010) in addition to theweakintroduction to sciences especially at theprimarygrades of formal education (Afolabi, 2013). In spite of efforts by science educators to enhance better achievement, science remains a boring subject at the foundation level and a frightening subject to learners in senior secondary classes. These could be a result of ineffective teaching of science at the primary school level (Afolabi, 2013). Olasehinde and Olatoye, (2014) asserted that the most beneficial way to learn science is to engage in doing science. This method gives roomfor pupils to become involved in the fact-finding. Doing science should not be limited to the classrooms; it should also be carried out outsidethe classand at home. The traditional method which is also known as the lecture method of teaching, is widely used in schools and has been found not producing the desired results (George, 2006; Saracho and Spodek, 2008;Olasehinde and Olatoye, 2014).

Science is also considered a subject that causes fear in students. This is manifested in the relatively lowenrolment for and performance inscience at secondary and tertiary levels (Olasehinde, 2008; Afolabi, 2013). Productive approaches to teaching and learning of science are needed to foster greater achievement in science at the primary level. One of such innovations is what this study investigated. Science has practical life application based on abstract concept. Ability to present the topics such that they can be reviewed outside of the school environment is important in impacting scientific knowledge (Bembenutty and White, 2013). Science classes should not aim at allowing pupils memorize scientific knowledge, butat helping them to gain the necessary attitudes and process skills necessary to solve real life problems.

Primary education is ofcrucial importance to the growth of any nation. As Aluko and Aluko (2008) observed, teachers in primary schools are the builders of the nation;they prepare the foundationupon which other educational levelsare built. The primary educational level is the most important tier of education because itserves as the basis for all other educational levelsand the foundation for the production of highly skilled professionals(Afolabi, 2005).

The primary education class is a place where pupils acquire the requisitebeliefs, knowledge, opinions, ideas, skills, and activitiesirrespective of gender, vocation orsocial

status (Bruns, Mingat and Mambila, 2003). However, attaining adequateprimary education is not innate. Several factors such as parents'socio-economic status and differences in educational criteria affect its outcome. The curriculum is a guideline of instructions used by the school to provide opportunities for pupils' learning experiences to lead to a desired outcome (Bluestein, 2001). From the curriculum, teachers are provided a framework of what and how to teach effectively. Teachers, as one of the school's chief resources, try to draw out the best in their pupils by transmitting knowledge, making it clear and relating it to the interests and capacities of the pupils. All these functions of the teacher require determinationand skill. Teachers adopt different methods to impart curriculum contents.

Inscience classrooms, pupils are supposed to be daily bombarded with new materials or new applications of old materials. Consequently, teachers should give pupils time to work with the materials andtake control ofthem (Skarsten, 2003). Teachers offer this opportunity through classroom activities, guidance and counselling programmes, school related work experience, school and community service projects, school library and other co-curricular activities (Huntsinger and Jose, 2009). At the primary school level, givinghomework is a method that extends and reinforces learning beyond the classroom. It is used by teachersto ultimately transform the learnt information into knowledge in the pupils. Younger pupils, especially, those at the primary education level, lack well-developed study habits (Williams, 2005). Also, a significant part of pupils' learning takes place outside of school.The extent to which they learn from homework depends on how much help they get from their parents. This further reiterates the fact that the two most authoritative circumstances in which pupils' development and learning takes place are the home and the school (Galindo and Sheldon, 2012).

The establishment of schools is to serve various functionslikeaiding pupils, under the educational influence of teachersto acquire academic learningin the schoolenvironment(Turmo, Guttersrud, Elstad and Olsen, 2009). Epstein, Salinas and Van Voorhis (2001) in Galindo and Sheldon (2012) argued that since both the home andschoolhave a potent influence on pupils, their development and academic performancewill be enhanced by the degreeto which the relationship between teachers and family members are maintainedand geared towards helping pupils tosucceed academically. They argued that schoolsthat have forged strong partnership between the

family and community through policies and practices are better able to help pupils to succeed academically and to develop scientific attitudes.

Considering that acore objective of science education is the development of scientific attitude, it is not to be confused with attitude towards science. While Olasehinde and Olatoye (2014) described scientific attitude as the systematic, rational and objective ways torespond to a new or hard to comprehend situation, Yara (2009) opined that attitude towards science refers to curiosity, concern or the impression one has towards studying science as denoted by the tendency to like or dislike science. In another vein, differentiating scientific attitude from attitude towards science,Bennett (2003) in Anwer, Iqbal and Harrison (2012) reported thatscientific attitude is connected to the mental reasoning or scientific method coveringtheundertaking of practical work skills while attitude towards science relatesto the opinions, perspectives and pictures aperson develops about science as a result of association with different situations.The scientific attitude examines scientific acts or ideas. It entailsdoing thingsbased on tested principles rather than assumptions, superstition and popular opinions without empirical backing (Olatoye and Aderogba, 2012). To be scientific means to berational, curious,critical, objective, humble,honest, open-mindedand willing to suspend judgment (Olasehinde and Olatoye, 2014).

Martin, Sexton, Franklin, Gerlovich and McElroy (2009) posit that science attitudes are significant for some major reasons. First of all, a positive attitude of a child conveyspositive mental readinessfor people and things related to science unlike a child who is not ready. This readiness factor develops unconsciously in a child. Secondly, attitudes are not innate; they are acquired and imbibed as a child grows. Lastly, experiences can change a child's attitude. Parents and teachers help most in shaping science attitudes. One main concern with attitude, though it isformed early in children, it diminishesif not nurtured. An important tendency which is found among all human beings, and especially in children, is curiosity. Children tend to be curious to know about various things they observe around themselves in their daily life.Preschools children have the curiosity, natural inquisitiveness and sense of wonder that is needed tomold the development of scientific attitudes (Eshach and Fried, 2005; Howitt, Lewis and Upson, 2011). As they grow older and move up the primary classes, this curiosity begins to reduce as tasks that enhance it are no longer given. Children sit in science classes with little or no time for hands-on activities, practical or experiments.Schools do not have

science facilities or laboratories and teachers use more of the conventional method of teaching.

Since attitude has been found to correlate positively with achievement in science, teachers should endeavour to develop scientific attitudes in their pupils. To do this, they should be provided with hands on experiences (Nzewi, 2008; Nwosu, 2008). Young children should be seen as active learners by teachers and should be engaged to the learning process. These will enable them to develop understanding and build meaningsthat are worthy and also valuable to their intellectual development. Approaches that promote scientific attitude arechild-centredand provide avenues and time to engage their curiosity in experimentations, explanations and explorations (Wilson, 2007). Ekine (2010) asserted thatfor good achievementin science, interests and attitudes of pupils towards science need to be developed and properly harnessed right from the primary school level where the solid foundation for the subject is laid. Pupils with a proper scientific attitude achieve more and have thepotential to integrate science into their daily lives when they appreciate its importance.

Effective science education in the primary school, if handled well, could acceleratethe accomplishment of national goals and objectives in science and technology as stated in objective (v) of teaching primary science in the revised edition of the National Core Curriculum for Primary School Science, that is,to develop a scientific attitude including curiosity, critical reflection and objectivity. This study sets out to measure the level of development of four scientific attitudes; namely: curiosity, rationality, critical mindedness and honesty. Since attitudes are latent but not evident in the present and therefore not observable on their own, the teacher must identify some actions that would seem to be representative of the attitude in question so that this behavior might be measured as an index of the attitude.

The National Policy on Education (2013) identifies one of the objectives of primary education, as the laying of a sound basis for scientific, critical and reflective thinking. The policy also stipulatesemployingpractical, explanatory and experimental instructional strategies in the teaching and learning of primary science. Pupils in science classes should not only be taught the knowledge needed in the class, but also how to solve problems, think rationallyand develop scientific attitudes that will make them capable of applying what they learn in the class to their everyday living. Developing a good

scientific attitude has an important effect on the learning process (Altinok, 2004). Altinok, discovered that individuals develop scientific attitudes when they work with objects that are in line with their needs. In other words, when science lessons are made more meaningful, scientific attitudes are developed in the pupils. Attitudes related to science are connected to pupils' active participation in science lessons. This participation can further be enhanced when teachers give purposeful homework involving parental support. The more pupils participate in science lessons, the more their attitudes improve. Giving of interactive homework by teachers allows pupils to involve their parents in schoolwork and also helps in developing a better scientific attitude. Homework forms a meaningful part of pupils' cognitive experiences cutting across all the tiers of the educational system (Tam and Chan, 2009).

Cooper (1989; 2007) defined homework as academic work given by school teachers to pupils and are supposed to bedone out of class.It is an educationally planned activity that should be completed by the student outside the fixed schedule of the class.This view is corroborated by Katz, Kaplan and Buzukashvily (2011) who described homework as a distinct academic task given at school but is carried out at home.Arbind (2006) views homework as tasks students do out of class, as an extension of classroom work. It is students' work done by spending time out of the classroom on allotted activities to practice drills and exercises,strengthen or utilize newly learned skills and information, and to discover the requisite skill of independent self- study.Homework is commonly assigned to pupils in primary schools because it is believed to improve their performance (Cooper, Lindsay, Barbara and Greathouse, 1998 and Ogunsanwo, 2003). Homework demands pupils, parents and teachers to committime and effort on assignments (Van Voorhis, 2011). Katz, Kaplan and Buzukashvily (2011) submit that it isrequired of pupilsto add to their learning in school by doing homework. They also pointed out thatparents, teachers, policymakers and administratorsview homework as crucial for achievement and learning.

Educators like Ogunsanwo, (2003), Van Voorhis, (2004),Arbind, (2006) andCooper, (2006, 2007) have identified different types of homework such as practice, preparation, extension and creative homework. Cooper (2006; 2007) describes practice homework as the type designed to reinforce learning and help pupils togain specific skills. It involves doing other exercises given by the teacher to promote more practice on the work done (Ogunsanwo, 2003). Preparation homework ispremised on usingmaterials for future

lessons (Arbind, 2006) while extension homework is meant to apply skills formerly learnt to new situations and promotes self-directed learning (Cooper, 2007). Lastly, creative homework helps pupils toincorporate various concepts in promoting the maturation of vital thinking and problem solving skills (Laconte, 2009). Studiesexamining the effects of the various types of homework on academic achievement are still ongoing.

Homework, in many Nigerian primary school classrooms,is given daily, weekly and or monthly to assist school work. With this regularity, less concentration is given to sorting out problems pertaining to homework and how homework assignments and processes can be improved. Homework is of great significance in reviewing important lessons that were taught in class (Skaggs, 2007). Since the school day is usually short and the amount of information to be passed is voluminous, teachers can benefit by giving homework that review what is taught in class. In addition to acquiring additional practice, working on a concept outside of schoolprovides additional opportunities of the lesson being learned (Suresh, 2012). Homework provides a school-to-home connection and an avenue for family members to interact with the child and be abreast of what the child is being taught. With this interaction, they can reinforce what the pupil is being taught by showing and giving real life and first-hand knowledge to lessons where feasible. Homework has been a form of assistance to developing scientific attitude. Since it iswork done outside school hours, pupils have time to explore, inquire and carry out investigations which are part of the skills that aid scientific thinking, resulting in better achievement in the science class.

Homework has not always been easy for both parents and pupils. Oftentimes, homework brings clashes between home and school. Voluminous homework leads to parents calling for a reduction because itencroaches on family time (Ekici, 2014),creates boredom and denies pupils access to leisure activities (Kralovec and Buell, 2000; Coutts, 2004). Homework has been identified as a main source of tension for students and can lead to confusion whenparents'instructional methodsdiffer from those of the teacher (Kohn, 2006). Also, parents sometimes protest homework are too difficult or too easy,too little or much (Kralovec and Buell, 2000). Furthermore, teachers sometimes express displeasureover parents not showing enough support, lack of know-howand time in preparing good homework. Reports of differences of opinions between parents and teachers appear often in literature and in the media.Horsley and Walker (2013) asserted

that the impact of homework on academic achievement is limited,many researches make reference to positive associations between homework and academic achievement (Ogunsanwo, 2003; Macdonal, 2009; Bembenutty, 2010; Akioka and Gilmore, 2013 and Ekici, 2014).

Researches have shown that teachers are significant in planning and allotting homework and in relating with parents and pupils concerning good parentalhomework participation(Epstein, Salinas and Van Voorhis, 2001; Van Voorhis and Esptein, 2002). Many teachers at the primary school level are yet to have good grasp of these skills. Homework in our classes today are often boring and tiresome,failing to generate creativity and interest in pupils. Also, parents are not trained to talk about some homeworkconstructs with their wards. This may be a disadvantage to parents as they may not know how to render the proper help at home (Horsley and Walker, 2013; Ekici, 2014). Furthermore,methods that provide guidance, encouragementand developadequate interactions may allow forincrease in achievement and promote better forms of parentalinvolvement amongst pupils, parents and teachers.

Followingseveral studies of homework and parental involvement, Epstein and her colleagues developed a homework method to encourage pupil's learning, parent–child interactions and parent–teacher communication that led to the Teachers Involve Parents in Schoolwork (TIPS),a version of interactive homework programme (Epstein and Van Voorhis, 2001; Epstein, Salinas and Van Voorhis, 2001; Van Voorhis and Esptein, 2002; Bailey, Slivern, Brabhamand Ross, 2004). TIPS is a teacher-parent partnership designed, implemented, and testedby several teachers. These researchers developed an interactive and non-interactive homework program for different disciplines. The homework programme includesgoals for learning and instruction for working with the assignment including how to involve family members.

Interactive homework assignment differs from conventional homework, in that they are assigned less frequently, that is, once weekly or fortnightly.This givesstudents ample time to complete their activities. Part of the homework guides students on what to do to allow family member’s participation. Spaces are also provided for feedback from parents. Interactivereal life homework activities are incorporated into the curriculum and intended to increase the scope of students’ learning.Homework that employs real life activities and are interactive rectify series of shortcomings inhomework practices. This is

becausetheyexplore the use of a systematic and scientific approach which assists teachers to list topics in the curriculum that call for interaction for easier understanding and assimilation.The interactive real life homework content is structured in such a way that prompts pupils to explain what has been learnt in school or ask precise questions about what they are learning.

Parents and family members are saved from experiencing inadequacy in particular topics or concepts as teachers plan interactive questions which parents can discuss with their children without having anelaborate knowledge of the topic. Interactive homeworkhas a section for feedback from the home which allows the parents to put across to school the strengths and shortcomings of the homework. Information on how the assignment was done,or how pupils viewed the assignment are given as feedback to the teacher to modify subsequent assignments(Epstein, Salinas and Van Voorhis, 2001; Van Voorhis and Epstein, 2002). Interactive real life assignments require pupils to discussabout the learning experience with someone at home. This offers the opportunity to associate homework with daily family life experiences. Battle-Bailey (2004) observed that Interactive Homework additionally improves parent-child interaction.

With interactive real life homework, a three-way partnership is built amongpupils, families and teachers at the primary school with each part seeing the need and appreciating the efforts of others. Interactive real life homework also promotes development of scientific attitudes. This homework type gets pupils involved in doing science. It focuses science lessons around using the five sense organs of hearing, touching, seeing, smelling and tasting. Pupils are from time to time,engrossed in doing science andfindingout interesting things about themselves, othersand the world around them(Olasehinde and Olatoye, 2014). As a result, pupils become curious, observant, objective about issues and arerational in their thinking. All these evolve into attitudes needed to enhance better achievement in science. Interactive homework activities must be challenging and engaging so that pupils will be apt to show and share it with parents or family members. The activities encourage pupils to gather information,write, collect suggestions,think,draw, sketch,explain,construct things, demonstrate or interact with a parent or family member in other ways (Epstein, 1992).

The main goals of interactive reallife homework are: to promote the teaching of science and carry-out demonstrations after the interactive real life homework are assigned. It is

also meant to lead pupils in discussing science activities with their parents or family members at home. Itkeepsparents abreast of their children's science exploration and learning progress while also encouraging feedbacks from parents on science homework and children's progress. Van Voorhis and Epstein (2002) gave a format with which interactive real life homework should be given to pupils.Firstly, every interactive real life homework sheet should indicate a brief information or explanationto parents, guardiansor family membersabout the science topic and skills needed in the activity. Secondly, each pupil signs the letter and writes the date of submission of the homework. Thirdly, the learning goals of the homework are outlined in the objectives. Also, materials that are cheap and can be easily obtained at home or school are used.Procedure that guides the pupil gradually on how to go about the homework must also be specified.Laboratory report or data chart also allows the pupil to describe their findings.Conclusion which guides the pupil in discussing result(s) and real life applications of science with parent or family member must be included.Home to school communication allows the parent or family member to submit a feedback indicating their views, opinions and suggestions about the homework with the science teachers.Lastly, each parent is to append his/her signature on the homework sheet to signify their involvement in the homework.

Non-interactive real life homework, on the other hand have the same content as the interactive real life homework but they have no reminders for the pupils or members of the familyconcerning their participation in the homework. Parents are not given any letter sensitizing them about the homework, neither are there any home-to-school communications or questions requiring family members' participation in the homework. Also, parents are not required to append their signatures on any activity.

Interactive homework, allows families to participate in and be abreast of the learning activities of their children at home. It also improves academic performance and homework completion rate(Van Voorhis and Esptein, 2002).Other advantagesof interactive real life homework include:basic skills of learning are reinforced; opportunities are given to pupils to apply these skills in real-life situations; parents are encouraged to talk about homework while assisting their children and sharing their experiences with them. Since interactive real life homework will be aligned with existing curricular goals, most of the homeworkinvolve critical thinking and real-life application of knowledge and skills.

Practice homework which also serves as the control in this study is the most common type of homework given in primary classes (Ogunsanwo, 2003). These are end of lesson assignments given to pupils without any content or guidelines on parental involvement. It involves end-of-lesson exercises or other exercises, given by the teacher, that helps to reinforce what has already been presented in the class. It does not give guidelines nor any specificity of involving parents in the homework.It does not have any content as the interactive real life homework and non-interactive real life homework. Ithas no remindersfor the pupil or members of the familyconcerning their participation in the homework. Parents are not given any letter sensitizing them about the homework, neither are there any home-to-school communications or questions requiring family members' participation in the homework. Also, parents are not required to append their signature on any activity.

Parents are getting more aware of the importance of involving them in the schooling of their children(Epstein,1992) as children cannot be educated in isolation from their families (Hill and Taylor, 2004). A majorindicator of parental involvement at home andschool are the pedagogical practices that promote and guide parentalparticipationand specific school programs (Hamilton, 2010). Closing the thin line between school andhome is a maintarget for educational institutionsglobally. Participation of parents in the learning of their children is critical to fulfilling this aim. In America, the "No Child Left Behind" Act of 2001, has parental participation as one of the target fields for change. The National Coalition for Parental Involvement in Education has the promotion of parents' participationin children'slearning as theirprincipal aim. Huntsinger and Jose (2009)emphasised the needfor schools to contact parents and get them involved in their children's learning. The "No Child Left Behind" Act of 2001 alsomandated schools to establishand give room for parental involvement alternatives. Virtually, all government and private early childhood programmes and elementary schools in America havecreated the platform for parental participation in their children's academics (Huntsinger and Jose, 2009). The educational reforms of many states also include efforts aimed at heightening parents' involvement.

The Universal Basic Education (UBE) plan established the ten (10) year basic educational programme to wipe out poverty, illiteracy and ignorance in addition toquickening and stimulating national integration,development and political consciousness. The UBE programme is a strategy for implementing and achieving the

Education for All (EFA) and the education-related millennium development goals empowerment and development strategy. The Nigerian Government is to provide compulsory, free and universal basic education for every child of pre-primary, primary and junior secondary school age.Every parent would ensure that his child completespre-primary, primary and junior secondary classes. In addition, teachers and parents are to work together to evolveprogrammes thatheighten parents' participation in their children's schooling.

The United States national surveys assert that,often, parentsget involved at home as shown in their assistance with homework. About seventy percent of parents help their children once weekly, regardless of their educational background, race or socio-economic status (U.S Education, 2006). Many studies (Barry, 2006; Ogunsola and Adewale, 2012; Suresh, 2012) have shown the influence of socio-economic status of parents on parental participation and academic performance of children.A child's potentiality to excelacademically is influenced by how the child is handled at home (Suresh, 2012). The attitudes, skills and behaviorrequired in molding a child into a productive and successful pupil is learnt at home. However, not every home can provide the requisite educational resources necessary to groom a child for academic success. Therefore, socio-economic status of parents is consequential in making available these educational materials. Acoherent finding is that parents with high socio-economic status are more involved in the academics of their child (Eagle, 1989; Shaver and Wall, 1998; Suresh, 2012). That is, the higher the parent's occupation status, income and education level, the higher would be theirparticipation in their children's educational activities. Therefore, the wherewithal and strength of parental socio-economic status enhances theacademic success oftheir children.

Most parents desire a highacademicperformance for their children in schoolirrespective of their socio-economic status,to qualify them tochoose careers that will increase their chances of getting jobsin the future.Szechter and Carey (2009) submit that regardless of the socio-economic status of parents, higher science achievement can still be made by students through parental involvement in science provided the parents have a positive attitude towards science.Positive parental attitudes are reflectedthrough theirdirect support for science activities like science exhibitions or indirect support such as getting involved in science homework activities. Hango (2007) opined that parents could

significantly compensate for their lack of financial resources by associating and connecting more with their children's education. Simply engaging children about science materialsused in class and activities conducted in schoolcan greatly benefit children, thereby enhancing their performance in scienceand promoting their development in scientific attitudes (OECD, 2011). It was also revealedthat parents' interpersonal relationships with their children and teachers influence parental involvement more than parents' socio-economic status (Green, 2007).

When parents get involved and show much interest and enthusiasm in the science education of their wards, the wards see them as role models in support of their work. According to Kaya and Lundeen (2010), parental participation may help children enjoy science subjects and increase their interest in learning science.Parents who show their children that they value education and use it in their day-to-day living,are worthy role models to their children andcontributesignificantly to their success (Perera, Bomhoff and Lee, 2014).

School type is also a factor to be considered in the present study as it affects achievement and the scientific attitudes of pupils. The quality of a school can determine the academic achievement of itspupils as is evident in the disparity between pupils' academic performance in the government and privately owned schools. A conducive learning environment, fortified with quality teachers and learning materials, attractive physical structures and functional science facilities enhance the academic achievement of pupils as well as help in developing their scientific attitudes. A stimulating school environment arouses pupils interest to learn. The degree of interest derived from the learning environment affects the academic performance of pupils. Okon and Archibong, (2015) affirm that most private primary schools are better equipped with basic amenities and decorations when compared to public primary schools that are poorly structured, equipped, inadequately ventilated and decorated. Schools that are poorly equipped negatively affects the teaching and learning resulting in low academic performance of pupils. Science equipment and facilities in schools create avenue for children to relate with science by performing scientific experiments and investigations. When children enjoy doing science, it reinforces their scientific attitude.Studies have shown how the characteristics of schools, whether they are publicly or privately owned, affect pupils' acquisition of cognitive skills (Newhouse and Beegle, 2005). Etsey, Amedahe and Edjah, (2005) ascribed increasing interest and performance of pupils in science related

studies to the type of schools- (private or public) such pupils attend.Private school pupils' positive attitude towards science and other subjects may arise from the fact that more prospects and chances are given to them compared to their counterparts in public schools (Adeyemo, 2005; Afolabi, 2005; Corten and Dronkers, 2006; Okon and Archibong, 2015). Corroborating this further, Young, (2008) examined the differences in students' achievement in science and science related areas in private and public schoolsand found a negative effect with public schools in supporting the fact that achievement of students in public schools is lower than those in private schools.

Teachers in public or private primary schools, give homework to pupils. Ogunsanwo (2003) found out that pupils in private schools had more homework return rates than those in public schools as a result of better parental participation. Pupils in privately owned schools were able to complete their homework well and return appropriately. This helped in improving their performance and enhanced a positive attitude towards mathematics.However, the private schools may be said to have excelled because of the following: thorough supervision,proactive school administration, regular class assignments, conducive working condition and learning environment, cordial parent-school relationship, positive pupil-teacher interactions.

The family provides the foremost social educational environment for children (Shearer, 2006). Mothers, usually, are the initiatorsof learning and the natural teachers of children. Though, this teaching role is assumed by the school teachers once the children begin schooling after some years. However, parents' supportive role in children's learning should not end. Over the years, studies have indicated that the responsibility of formulating and administering homework falls on the teacher. However, most teachersare yet to master these skills, especially at the primary school level.Homework assignments are frequently irksome and boring (Ogunsanwo, 2003); and are not planned to involveparents(Epstein, Salinas and Van Voorhis, 2001). This study therefore investigated an approach in the science class that encourages, guides and allows for a developmentally appropriate interaction that enhances the acquisition of a better scientific attitude in pupils and also improvesachievement in science lessons.

1.2 Statement of the Problem

Thecause of poor achievement of pupils in basic science can be attributed to many factors. One of such factors is ineffectiveness of instructional strategies and inability

tocaptivate the interest of children at an early age thereby leading to low development of scientific attitude. Teaching science at the primary level is tasking. Therefore, science teachers at this level need to adopt a teaching style that will arouse the curiosity of the pupils andinspire deeper investigationsthat will facilitate learning experiences which will motivateand empower children to learn.The use of homework to enhance instruction at the primary school level cannot be discounted, given the duration of time that children spend at home.However, the use of homework requires some amount of skills to achieve maximum impact on the learner. Not much has been documented on approaches that facilitate the involvement of adults,using real life situations to develop appropriate scientific skills and improve achievement of primary school pupils.

Giving homework in basic science class with a resourceful teaching will lead to enhanced achievement, foster understanding of concepts and development of scientific attitudes.It is against this background that this study investigated two modes of real life homework and pupils'learning outcomes in basicscience,while parents' socio-economic status and school type served as moderating variables.

1.3 Hypotheses

Seven null hypotheses were tested at .05 level of significance. These are:

H_{01}. There is no significant main effect of treatment (homework types) on:

(a) Pupils' achievement in basic science

(b) Pupils' scientific attitude

$H_{02.}$ There is no significant main effect of parents' socio-economic status on:

(a) Pupils' achievement in basic science

(b) Pupils' scientific attitude

$H_{03.}$ There is no significant main effect of school type on:

(a) Pupils' achievement in basic science

(b) Pupils' scientific attitude

H_{04}. There is no significant interaction effect of treatment and parents' socio-economic status on:

(a) Pupils' achievement in basic science

(b) Pupils' scientific attitude

H_{05}. There is no significant interaction effect of treatment and school type on:

(a) Pupils' achievement in basic science
(b) Pupils' scientific attitude

H_{06}. There is no significant interaction effect of parents' socio-economic status and school type on:

(a) Pupils' achievement in basic science
(b) Pupils' scientific attitude

H_{07}. There is no significant interaction effect of treatment, parents' socio-economic status and school type on:

(a) Pupils' achievement in basic science
(b) Pupils' scientific attitude

1.4 Scope of the Study

The study covered primary six pupils in both public and private schools in Abeokuta South Local Government Area (LGA) of Ogun State. It investigated two modes of real life homeworkas well as parent's socio-economic status (high and low) and school type (public and private) on pupils' learning outcomes(pupils' achievement in basic science and pupils' scientific attitude). Attitudes investigated are curiosity, rationality, critical mindedness and honesty.The topics covered in this study are: drugs, sky and the earth, force and simple machines.

1.5 Significance of the Study

The findings of this study will provide evidence on the effectiveness of the interactive homework type in linking schoolwork to the real world experiences of pupils and families and thereby increasing pupil's retention and understanding of the materials covered. This will enhance better learning in primary schools and consequently improve primary school pupils' performance in basic science.

Also, findings will support connections between school and home as it will involve the family in the schooling process, increase their appreciation of education and acquaint them with what their children are learning and theirprogress in school. Thus, parents and pupils would beurged to talk on a regular basis about schoolwork and the progress made.

Teachers and parents are also enabled to often convey information about pupil's progress, work and problems.

It will also identify individual pupils' learning problems and help teachers to use the right type of homework at the primary school level. Consequently, it will enable schools to formulate policies which support homework.

Furthermore, the study will benefit curriculum planners as they will be able to recommend the use of appropriate homework in the basic science curriculum. Book authors will also be sensitized to incorporate interactive homework in their books. Lastly, it will enhance accountability amongthe pupils, teachers and parents.

1.6 Operational Definition of Terms

Achievement in basic science: These are the interpretation of scores obtained from pretest and posttest administration of achievement test in basic science showing the pupils performance.

Parent: This refers to biological parents,primary caregivers, step and adoptive parents, guardian or anybody available to help the child with his homework after school.

Family involvement: This refers to an awareness of, participation and involvement in schoolwork and help rendered by parents/guardian to a child to augment the educational progress.

Interactive real life homework:A homework assignment that requires pupils to discuss what they are learning in classwith someone at home. It offers opportunity to connectto the real world experiences of pupils and families, using real life situations and also giving guidelines on how parents should be involved.

Non-interactive real life homework: These are homework assignments that offer opportunity to connect homework to the real world experiences of pupils and familiesusing real life situations but which do not require pupils to discuss what they are learning in class with someone at home.This homeworkhas the same activities as interactive real life homework but without reminders,explanations and prompts for parents.

Practice homework: These are end of lesson assignments given to pupils without any content or guidelines on parental involvement.

School type: This is the type of school a pupil attends. It refers to the ownership of schools in terms of main source of finance. Public schools are the ones financed directly or indirectly by federal, state or local government while the private schools are those financed mainly by private individuals or organisations.

Socio-economic status: This refers to the level of education and occupation of the parents used.

S**cientific attitude:** This refers to pupils' scores in the scientific attitude questionnaire.Attitudes investigated are curiosity, rationality, critical mindedness and honesty.

CHAPTER 2

REVIEW OF RELATED LITERATURE

2.1 Theoretical framework

2.1.1 Vygotsky's Theory of Cognitive Development

The socio-cultural theory propounded by Lev Vygotsky states that, for cognitive developmentto be enhanced, children need to interact with other people and the culture around them. Learning is accelerated when children operate in their zone of proximal development (ZPD). The ZPD encompasseslevels of abilities and skills that are not yet fully mature. It entails the series of work that children cannot execute on their ownbut with the assistance of a capable adult, they can get them done. This strategy is based on the underlying assumption that what a child can do independently and what can be done with outside help determinegrowth and maturation of a child (Daniels, 1995). This in essence is one of the bases of giving homework to pupils. Childrenconcretise what they have learnt at the schoolwith deliberate help from adults at home. Adults, family members as well as peers can help children by giving direction, guidance and suggestions.

Teachers need the knowledge of ZPD to ascertain a child's level of achievement and to project into the future. They need to ensure a developmentally appropriate curriculum consisting of activities which are well planned and which specifies what children can learn with others' assistance as well as what they can do by themselves(Karpov and Haywood, 1998). When pupils involve their parents in homework, they are able to learn and get their tasks accomplished.

2.1.2 Epstein's Theory of Overlapping Sphere of Influence

In the theory of the overlapping sphere of influence,there are three significant factors that support the growth of children. These are: the family, school and community.Epsteinin her framework of family, school and community,focused on the students and posit that the major protagonists in their own development,education and academic achievement in the teaching–learning process are the students themselves (Epstein, 2011). The school, family and community cannot unilaterally turn out successful students. Epstein believed that there should be a partnershipto guide,

strengthen, involveand encourage students to be at their best and bring out the best. She opined that the home and school have equaland joint obligations for the children in their custody, and there must be a synergy between the endeavours of the school, family and the community.From this submission, it can be deduced that children learn best when all the significantothers in their lives adopt a collaborative approach to support and motivate each other by building an essential partnership in which the various entities acknowledge their common interests in, and responsibilities towards children. This encourages a symbiotic working relationshipthat motivates the triad to operate jointly in fashioning outmore beneficialopportunities and programmes for the students (Epstein, 2002).

Van Voorhis (2011)is of the view that thehomework process has direct bearing on the theory of overlapping spheres of influence. The three-context approach,home, school, and the community,have outstanding and collectiveimpact on thedevelopment and learning of children through the participation and interaction of parents, teachers, community partners, and students themselves. Each factor gravitatesnearer or drifts further awaybased on extraneous practices and forceswhich motivate or dampen the functioning together of the significant others who are into working relationships in the education of the children (Sanders, Sheldon and Epstein, 2005; Epstein, 2011). Sincehomework is done and completed within the home setting, these activities of learning tend to open up avenues for participation of parents in the teaching- learning procedure therebyraising the premium placed on education (Cooper, Jackson, Nye and Lindsay, 2001). When this happens,homework brings out the innate development of home-school collaboration and equally facilitates academic achievement.The major objectiveof student's academic successisbetter accomplished through mutual understanding,helps and support from schools, homes and communities (Epstein, 2011). The act of working togetheramong the home, school and the community tend to be more effective when the triad acknowledge the immense benefits the union will foster on all partiesinvolved. The result of this joint action is viewed as successful, valuable and worthwhile when each party is strengthened and committed to the success of the relationship (Hands, 2005).

2.2 Primary Education and its Objectives

In Nigeria,primary education is the education provided for and offered ineducational institutions for children. It spans six years and it is for children between the ages 6 to 12

years. With the introduction of the Universal Basic Education(UBE) law, primary education is nowmandatory and cost-free to all children. Since all the other strata of the system of educationare builtupon primary education, this makes it vital to the achievement of the entire educational system.

The National Policy on Education (2013), itemizes the objectives of primary education as to:

a) inculcate permanent literacy and numeracy, and ability to communicateeffectively;
b) lay a sound basis for scientific and reflective thinking;
c) give citizenship education as a basis for effective participation in and contribution to the life of the society;
d) mould the character and develop sound attitude and morals in the child;
e) develop in the child the ability to adapt to the child's changing environment;
f) give the child opportunities for developing manipulative skills that will enable the child function effectively in the society within the limits of the child's capacity;
g) provide the child with basic tools for further educational advancement, including preparation for trades and crafts of the locality.

Three key objectives are in line with this study. These are: laying a sound basis for scientific and reflective thinking, moulding the character and developing sound attitude and morals in the child, and giving the child opportunities for developing manipulative skills that will enable the child function effectively in the society within the limits of the child's capacity.The National Policy on Education (FRN 2014) and the Universal Basic Education (UBE) both allow for 6 years of primary school and 3 years of junior secondary school. One of the subjects through which the aim of primary education could be achieved in the first six years is basic science.

For primary education to be the foundation of the educational system, there is need tointroduce elementary and general knowledge of scienceto the learners, teach them to work with scientific gadgets, andmake themfamiliar with necessary foundational knowledge as they move to other levels (Umoh, 2006).

2.2.1 Importance of Primary Education

The purpose of primary education is to assist a child in many areas of life. In the primary education years, pupils are taught to think critically, strive to attain high standards, meet the challenges posed by technological advancements and develop basic citizenship values. Socialisation is another reason for primary education. Socialisation skills are acquired in the primary classes. The school becomes the agency that first organizes social relationships and the classroom turns to a place where children learn to socialize with their peers without the presence of their parents. Furthermore,primary education helps to ensure broad-based development of pupils. Pupils are able to develop their cognitive, social, emotional, cultural and physical skills to the best of their abilities in further preparation for secondary education. Ability to read, write and perform simple arithmetic is inculcated and developed in the child in primary school. This stage is the foundation for all intellectual developments in the future.

In line with the objectives of primary education and basic science, primary education should provide pupils with opportunities to acquire literacy, numeracy, develop ability for critical thinking and logical judgment, improve their creativity and communication skills, make them enjoy learning and develop the desire to continue learning.

2.3 Basic Science in Primary School

Science is a compulsory subject for all primary school pupils. For themajority of pupils, early interest in science begins or ends in the primary school. A pupil that does notcarry out or participate in learningscience early, is not likely to pursue the subject in secondary school and inhigher institutions. Aninadequate experience in sciencein primaryschool will certainlydiscourage further science studies. Primary educators have the responsibility of paving the way for futurescientists.Science education that is inspiring and of good quality at the primary level will give pupils the wherewithal to continue with science. Science lessons in primary classes nowadays are no longer seen as fun as lessons focus more on theoretical than practical aspects.

At the primary school level, teaching scienceassists in unravelling the potentials of a child and promotes a more beneficial understanding of the child's immediate

environment and the world around him. Basic science adds to the mental, social and physical developmentof children and the attainment of the objectives of the National Policy on Education(2014). Basic science education when handled well could induce the accomplishment of national goals and objectives in science and technology. Theseobjectives are to:

i. observe and explore the environment
ii. develop basic science processing skills including observing, manipulating, classifying, inferring, hypothesizing, interpreting data and formulating models.
iii. develop a functional knowledge of science concepts and principles
iv. explain simple natural phenomena
v. develop the scientific attitudesof curiosity, criticalreflection and objectivity
vi. apply the skills and knowledge gained in science to solve everyday problems in his environment
vii. develop self-confidence and self-reliance through problem-solving activities
viii. develop a functional awareness and sensitivity to the orderliness and beauty of nature.

The need for teaching basic science at the primary level is necessary as it helps pupils to explain events in nature; enables them to think and reason in a logical manner;teach pupils to solve simple problems they encounter on a daily basis and helps pupilsto develop social skills while working co-operatively in groups. Also,pupils are able to satisfy their natural curiosity through opportunities in carrying out scientific investigations; employ scientific knowledge and concepts to better their environment;develop positive attitude towards scienceand imbibe critical thinking and creativity. The primary level is the stage where children make their first contact with science and technology. Therefore, it is vital that teachers design ways of making children develop interest in science therebysurmountingany negative attitude towards their learning of science. Teaching materials should be motivating to attract the interest of the pupils while they are still young.

Practical, hands-on learning is fundamental in the teaching of science. All childrendeserve to enjoy science education and have right to practical experiences that are marked by quality and robust activities. They need to understand theimportance and

significance of science; so, it is vital that schools are equipped with an inspiring workforce that are well-resourced.

2.4 The Concept of Achievement

Studies have shown that family, school, society and motivation factors are among variables that influenceacademic achievement (Aremu, 2000). Examining the nexus between science achievement and homework in the middle school grades, Van Voorhis (2003)observed that students who do and complete more science homework tend to perform better in science. She further opinedthat participatoryhomework, which involve active interaction with parents or other students, were significantcomponents inascertaining effectiveness of homework. McMullen (2007) observed thatstudents who performed poorly in school and those whose schools cannot measure up to standardtend to put up improved performance when given extrahomeworkthereby bringing to a closethe difference between low and high performing students. In addition, McMullen reiterated that students' academic achievement can be facilitated by giving more homework, havingmanageable number of students andraising teachers' remunerations. Increasing the amount of allotted homework impact positively on achievement three timesas much as increasing teachers' salary and eleven times as much as reducing class size.

Marks, McMillan and Hillman (2001) posit that increased self-confidence among students, a conducive school learning environment, and a prominent parental drive for students' education positively affectstudents'performance in university entrance examination. Ryan (2005) observed that academic performance is directly proportional,to having parents whohelp at the home front. Research findings show that family participation impact on many areas of minors'education, such as daily school attendance (Simon, 2000), student achievement (Simon, 2000; Van Voorhis, 2001), behaviour (Simon, 2000) and motivation (Brooks, Bruno and Burns, 1997). Ryan (2005) further stated that parent participation plays a significant large role on children's academic performance. The above confirms that amajorhandicapto pupils' high academic performanceis the absence of parental involvementin children's education. However, some guidance on how they can appropriately do this is needed.

2.5 Scientific Attitude

Acquisition of knowledge and understanding through reasoning, and explaining natural occurrences by observation is known as science (Movahedzadeh, 2011). Developing scientific attitude isone of the purposes of science education. Attitudes relating to science are connected to pupil participation in science lessons. The more pupils participate in science lessons, the more their attitudes are enhanced.Therefore, the science class should be made more meaningful. Interactive homework allows pupils to involve their parents in schoolwork and help in developing a better scientific attitude. Scientific attitude, the way ofresponding systematically and objectively towards afresh or tough situation, entails depending on established principles in doing things (Olasehinde and Olatoye, 2014). Possessing scientific attitude,frees one from irrational beliefs andclaims that are not verified (Olatoye and Aderogba, 2012). A scientist is not essentiallyone with scientific attitude but a person,who deliberately recalls orproves to establish the validity of facts and showsattributes that are widely known to scientists. Scientific attitude is also the pattern of thought or attribute of scientists (Olasehinde and Olatoye, 2014). Being scientific means that one possesses attitudes such as curiosity, rationality, open-mindedness, critical-mindedness, objectivity, honesty, humility and willingness to suspend judgment.

Altinok (2004) views scientific attitude as aninclination to assess people,events,objects and situations in a particular way or relating science to a set of propositions. In the study targeted at finding the effects ofstudents' attitudes on science education, Martin, Sexton, Franklin, Gerlovich and McElroy(2009) submitted that attitude towards science lessonsaffects academic performance, acquisition of scientific attitudes and theprobabilityof studying thescience field. The more their attitude inclines towards science, the better their academic achievement. Pupils are not meant to memorise scientific information but to transform scientific knowledge into their everyday use. They are to know what to do and how to react when they encounter a situation and also gain thinking skills which are similar to that of scientists. Although, Icoz (2012) posited that gender should not be a determinant foracquiring scientific attitude, he affirmed that male students' attitude towards science is more positive than that of females. One of the reasons for this is that male students have more interaction with technological devices compared to females. This may also be as a result of interests during the early childhood period.

Acquisition of scientific attitude is the most significantresult of teachingscience (Ksheerasaga and Kavyakishore, 2013). Though some educationalists view scientific attitude as anoffshoot of scienceteaching, yetmost people regard it to bethe purpose of science teaching. Thurston (2004) considered attitude as thetotalsum of an individual's dispositions, mental outlook, worldviews and emotional state which may include, prejudice or colouration and a whole lot of others on any specific issue. Attitudes are developed and learnt within ecological purview; they are not inborn. They can be altered or amended in due course especially as the concerned individual progresses through life. The alterations of attitude may be as a result of a fallout of multiplicity of factors ranging from culture, tensions, needs, emotions, experiences and provisions. Attitude, fromscientific point of view, implies individuals' passion, interest and preparedness with due regards to the state of mind towards the pursuit of scientific knowledge.Once an attitude is developed early in the life of a child, it proves useful later on.

Ksheerasaga and Kavyakishore (2013) are of the view thatscientific attitude has to do with someone's outlook towards life. This is thereadiness to adoptscientific approaches andproffer solutions to issues.It also refers to a stablemind setthat aptly reacts to any member of a cluster of stimuli in the same general way. Scientific attitude predisposes an individual toconsider the possible aftermaths of alternative options, based on arguments fromfool proof evidence.

2.6 The Concept of Homework

Homework can be explained as academic work given by teachersto students,to be doneout of class(Cooper, 1989; 2007). This is quite different from assignments carried out during break time, recess, library hours or during subsequent classes. Power, Karustis and Hobboushe (1997) are of the view thathomework are assignments given out by teachers and are expected to bedone at home after the school day. In essence, homework is any deliberately designed educational activities meant for execution by students outside the normal class setting. Homework is after school activities given by the teachers tomake students practice, strengthen or utilize newly learned skills and information and to discover the requisite skill of independent self- study. It isany piece of work given by teachersto their pupils to be accomplished at home(Falkenberg, 2010). Homeworkis an important part of the lesson plan used extensively in Nigeria to reinforce classroom learning experience (Ogunsanwo, 2003). A lesson note is deemed incomplete

without homework (Ogunsanwo, 2003). It entails activities given by teachers to support the learning of children. It isanimportantway of expanding the scope of work done in the class. Educators have identified four types of home work: practice, preparation, extension, and creative homework.

1. **Practice homework:** This homework focuses on mastery of a skill or committal of knowledge to memory.Itstrengthens learning and helpspupiltake control ofparticular skills (Cooper, 2007). It involves doing end-of-chapter exercises or doing other exercises assigned by the teacher to promote more practice on the work done. Practice homework enhances achievement of higherscores at all grade levels in class tests(Cooper, 1989; Cooper, Robinson and Patall, 2006). Sometimes, it requiresstudents to repeatedly do the same kind of work to enable them to remember a skill. Practice assignments reinforce newly acquired skills and help students to attain an independent level in executing the skills. Practice homework also enhances speed of completion and accuracy.

2. **Preparation homework:** Thistype of homework brings in materials that will be used or knowledge to be learnt ahead of lessons to be taught in the future (Arbind, 2006). It assists students in learning new materials or lessonswell when it is done in class and helps them to obtain the maximum benefit by providing background information or experiences (Cooper, 2007). It also refers to the assignment given prior to the class meeting (Ogunsanwo, 2003). This type of homework involves using a new material, which learners may not have been exposed to before the lesson.It involves thinking on what had been earlier taught or what is about to be taught. Learners are given sufficient guidance to embark on their work independently. Preparation homework helps in getting thestudentsset for succeeding lessons or activities to be taught in class. These activities may include finding out, observing or doing background studies on an issue or topic to be consideredafterwards. Learnersneed tohave prior knowledge about a topic to be worked on.

3. **Extension Homework:** The extension homework uses skills that have beenlearnt earlier to new circumstances (Cooper, 2007). It is allotted work, allowing students to move beyond abilities, constructs and information that were learnt in class and practised at home. It extends student's exploration of the topic more fully than the class time permits and helps him gain skill in independent learning,looking up references and

finding useful resources from libraries. Project, problem solving and individual research are utilized in extension homework. Most of the time, extension homework is long-term and parallels class work (Arbind, 2006). It allows students to go after knowledge personally and creatively. In extension homework, students need to be able to connect separate topics. Extension assignments includeterm papers, science fairs and projects. Extension homework might require students to carry out research, examine and note differences and similaritiesin items, support a position or generate images and information from the computer. A longer time may be needed in preparing extension homework than practice or preparationhomework. It may also be done within a short period. A major difference between extension homework and practice homework is that it utilizes knowledge learnt in a new and differentway (Laconte, 2009). Extension homework focuses on yieldingsomething new, different fromthose of practice and preparation homework.

4. Creative Homework: The creative homeworkentails forming mental images of events or things. It is usually more of an independent workcoupled with the acquired knowledge and skill.Creative homework encourages the maturation of vital thinking and problem solving. This homework type sometimes takes the form of ongoing projects that gives room for students to make their own choices.Students are to demonstrate their knowledge creatively, using thought-provoking assignments. It includes synthesizing, analysing and evaluating concepts or skills already taught. Students are given opportunity to work out and employ their own ideas about a topic and organize a presentation for the teacher or class. Creative homework provides a good possibility for teachers to assess cross-curricular skills requiring students to bring together learning from numerous fields(Laconte, 2009).

2.7 Parental Involvement and Academic Achievement

Six types of parental involvement developed by Epstein (1995) in Huntsinger and Jose (2009) are:

1. Parenting: creating an enabling home environment that gives credence to academic achievement of children;
2. Communicating: planning an efficient two-way model of communication from school-to-home andfeedbackfrom home-to-school;
3. Volunteering: enrolling the help of parents;

4. Learning at home: furnishing parents and families with ideas, information and help concerning homework;
5. Making decision: enlisting parents as participants in decisions made at school; and
6. Community collaboration: building better schools and families by incorporating wherewithal, resources and services of the community

In clarifying learning at home, Huntsinger and Jose (2009)posit that Help with homework means paying attention, supporting,supervising, and talking about and over the given work. In other words, learning at home also means parents assisting with homework and teachers providing the framework and activities for parents to execute with their children. Fan and Chen (2001), in their studies on parental involvement, highlightedthe following areas of involvement: control, supervision, monitoring, and helping. These attributes show the duties of parents in relation to the academic achievement of their children. They submitted that Chinese parents render assistanceto their children in the early period of life with homework, examine the homework of their children, and check behaviours that might hinder performance.

Parental involvement according to (El Nokali, Bachman and Votruba-Drzal, 2010) are the behaviours of parents intended to support their children's academic work both at home and in school.Homework is a way by which parents associate with and participatein the education of their children. Homework is important in:

(a) bridging the communication gap between parents and children

(b) making parents and other adults aware of what the child is being taught at school and

(c) getting feedback from home to school (Walker, Hoover-Dempsey, Whetsel and Green, 2004).

Epstein (2002) further defined parental participation as thecreation of an environment at home that encourages and strengthens their children as learners. Educators' role in parental involvement should not be limited to getting feedback from home alone but also includemasterminding training for parents andorganizing workshops for parents on child rearing and family literacy. Researchers(Sanders, Sheldon and Epstein, 2005) have shown that parents who participate, getinvolved and support the learning of their children have improved grades in mathematics standardized tests and reading and lesser

learning disordersthan children whose parents do not participate. Early intervention of parents through involvement in the academics of their children increases the reading ability and drastically reduces behaviour problems (Miedel and Reynolds, 1999). Hill and Craft(2003) found that among low- to middle-income African American parents, involvement and participation in the schooling activities of their children was positively related to better behavioural ratings, higher achievement in reading and better maternal evaluation of children's emotional regulation.

A significant predictor of achievement in primaryclasses is parental involvement. This is so on account of parents participating morewhen their children are younger than older.Younger children, also, easily respond to parental values.In a study,Rogers, Ryan, Adams and Keating (2009)examined the effects of involvement of parents in primary school achievement,it was shown that mothers' involvement and participation at home is indirectly related to achievement. Girls have higher competence in learning, better reading ability and more active management of the learning environment. On the other hand, boys reported higher achievement in mathematics and more academic pressure from their mothers.

Parental involvement can also be viewed as help given tostudents with their homework at home by parents. AUnited States national survey, shows that parents assist children with their homework. Approximately, seventy percent of children are helped by their parents at least once weekly, irrespective of race,educational background and socio-economic status of parents (U.S. Department of Education, 2006). Parents can be connected in this participation with the teacher's assistance in offeringinformation on how to supervise schoolwork at home.Teachers can also, discuss homework policies of the school with parents andprovide skills needed by pupils to improve in their assessments.

The act of dedicating resources to the academics of children is also known as parental involvement. Home-based parental involvement is those school related practices that occur out of school but not necessarilyat home. These include: assisting with homework, working together on a school project, preparing or studying for an academic test together, taking them to zoos and museums and reading books together. Parental involvement both at home and school has been notedto enhance pupils' achievement in school (Hoover-Dempsey, 2001; Hill and Taylor, 2004; Pomerantz, Grolnick and Price,

2005) and positive effect on the completion of homework (Epstein, Salinas and Van Voorhis, 2001) and thusleads to improved academic achievement (Epstein,Salinasand Van Voorhis, 2001; Skarsten, 2003). Fan and Chen (2001) in El Nokali et al (2010) analysed 25 studies of parental involvement and academic achievement. Average correlations were found between involvement and mathematics but reading achievement scores were lower.Cooper (1989) also found correlations between parental involvement in pupils' homework and achievement. This further corroborates that the better and more appropriate the parental involvement, the better the achievement.

Parental involvementinhomework increases parents' appreciation of schooling. It allows parents to acquire useful first-hand information relating to how and what children are learning in school. These help in buildingcognitive and metacognitive skills in children andspeeds up a child's learning that resultsfrom constant practice (Senechal and LeFevre, 2002). Besides, parents benefit from having exact information on their children's capabilities and potentialities (Connors and Epstein, 1995). In their study with parents of disadvantaged children, Castro, Bryant, Peisner-Feinberg and Skinner (2004),using family background as control, found thatincreased parent participation in preschool and nursery activities was later connected with lower rates of grade repetition, higher reading achievementand fewer years in special education when children were in eighth grade.

When parentsget involved with their children's homework, there is improved communication between the family and school. Teachers, seeing parents getting involved, give children the utmost attention needed toward developing their necessary skills. Shearer (2006) emphasised agreement in the association between active parental involvement practices by families and homework in enhancing positive schooling output of better grades, more favourable attitudes towards school, less dropout rates and more attendance. Epstein (2004) also added other positive academic results like: a decrease in rate of crimes, violence and vandalism in school. Other advantages of parental involvement in the homework of their childreninclude: establishment of psychological and physical structures for the child's homework performance; engagement in interactive activitiesbacking up student's understanding of homework and proffering strategies that help students to learn processes contributory to achievement (Hoover-Dempsey et al, 2001).

Interference with learning can also occur with parental involvement especially when parents useteaching methods that are different from those used in school. This confuses the children, orwhen parents do the homework for their children even though they are capable of doing it alone.

2.8 Importance of Homework to Academic Achievement

Teachers assign homework for several reasons. It could be an activity to extend the lessons taught in the day, an appraisal of lessons learnt in class, a way of preparing pupils ahead of class, passing across new knowledge that was not taught in class, practicing exercises toenhance the lessonslearnt, orsimply a necessity established by the school management. Irrespective of the motives ofallottinghomework, many benefits accrue to pupils completing it. Homework makes pupils responsible by demanding that pupils finish the work at home and return to school on the specified date. Also, the skill of time management is taught by givinghomework. The pupils are given a time lag onthe assignment and are expected to turn it in at a specifieddate.

Homework makes learning relevant through constant practice and experience. It creates an avenue for accountabilityandresponsibility in pupils, aswork habits necessaryfor successis developed.The involvement of parents, teachers and pupils in homeworkfurther extends the learning process outside of school. Student achievement has been found to increase with constant and regular homework (Cooper et al; 2006). In advancing the learning process, consistent and purposeful homework should be given priority.Teachers and parents at the elementary level agree that homework is importantto pupils because it stimulatespositive study habits and sense of duty (Drummond and Stipek, 2004; Adeyemo, 2005). As pupils mature, theyacquire the self-discipline needed for independent study in the junior and senior secondary schools. With homework, learning is not constrained to the four walls of the classroom as pupils gain knowledge outside the classroom.

Homework opens the door for important synergybetween families,schools and other significant adults taking care of children and pupils (Fan and Chen, 2001; Jeynes, 2007). A well-constructed homework allows parentsto connect with the schooland participate in what pupils are learning. They also have the chance of talking with their wards about what they arelearning at school as well as interacting with the teachers and the school-

community about ways ofreinforcingpupils' learning (Cooper, 2007).Homework makes pupils study throughout the term and, therefore, avoid the cramming pitfall.

Homework has both positive and negative impact from pupils, teachers and parents.Literature on homework affirm its abilitytoenhance student achievement andits damaging effects on family activities, health of pupils, and learning attitudes (Kralovec and Buell, 2000; Bennett and Kalish, 2006). Some parents claim that homeworkgiven is often too elaborate or short, too difficult or simple, and not clear (Kralovec and Buell, 2000). When parents helping with homework, use a different approach from that used by the teacher, it may confuse the child. Teachers express displeasure at their lack of know-how in constructing good assignments, shortageof time to prepare good assignments and parents not showing enough support(Kohn, 2006). Pupils also complain that homework takes a large chunk of their leisure (Kralovec and Buell, 2000; Coutts, 2004).Spending too much time on homework can bore pupils and make them not to have enough time for rest and relaxation.Manypupils regard homework as theroot of tension in their lives (Gill and Schlossman, 2000). Homework can also lead to undesirable behaviours like copying already done assignments from another person or enlisting people's assistance that involves more than guidance on the homework.

2.9 Interactive Real Life Homework

Homework can be distinguished by the level of interaction in which it is completed either with outside help orby oneself, by a group of students, or with help from a parent, sibling, or other individual (Cooper, 1989). From several researches of homework and parental involvement, scholars developed interactive and non-interactive homework programmesfor different subjects(Epstein, Salinas, and Jackson, 2001; Van Voorhis and Epstein, 2002). Interactivereal life homeworkhas clearly statedgoals to be attained for learning, directions on how to complete it and precise instructions to the students detailing the involvement ofparents or family members. Interactivereal life homework isdifferent from the conventional homework in various ways. Firstly, they are allotted weekly or fortnightly. Secondly, the students arepermitted to involve their familymembers,duringthe several days they have to complete their activities. Thirdly, some portions of the activitiesgive explicit instruction to students on how to get their family members involved and finally, feedback mechanismsare provided forparents

orfamily members. Interactivereal life homework activities are incorporated into the curriculum and intended to increase the scope of students' learning.

Interactivereal life homework is structured to rectify series of shortcomings in thepresent homework practices.Thisresearch-based approach to homeworkaids teachers indiscovering topics and lessons in the curriculum demanding interaction for betterunderstanding. The interactive real life homework content is organisedto prompt pupils to explain what has been learnt in school or ask precise questions about what they are learning from parents or family members to allow them to participate in the homework.Interactivereal lifehomework questions are planned in such a way that parentsdo not require to be experts in the subjectsor have elaborate prior knowledge before they can participate.A part of the interactivereal lifehomework serves as the feedback section to the schoolwhere parents and pupils can express their opinions and views about the strengths and shortcomings of the homework to enable teachers to adjust subsequent activities that may be given(Epstein, Salinas andVan Voorhis, 2001; Van Voorhis and Epstein, 2002).

2.9.1 Goals of Interactive Real Life Science Homework

The goals include:to promote the teaching of science and carry-out demonstrations after the interactive real life homework are assigned; to guide pupils into discussing science activities with their parents or family members at home; to update parents about the work and improvement of their children in the science class and to elicit feedback from parents concerning their children's progressand homework.

2.9.2 Interactive Real Life Science Homework Format

Van Voorhis and Epstein (2002) gave a format with which interactive real life homework should be given to pupils. Every interactive real life homework sheet comprises items that are meant to guide the pupils and the guardians that are involved in the activity. These items include: a letter to the parents or family membersgiving a short explanation about the topic and skills needed in the activity;a space provided for each pupil to signand write the date of submission of the homework. The objectives outlining the learning goals of the homework and materials that are cheap and easily available at home or school. Also, specified in the sheet are theprocedure that guides the pupils on how to go about the homework.Laboratory report or data chart allowspupils to describe

their findings.The conclusion section is for the pupilsto discuss the result(s) and real life applications of science with parents or family members.A section is provided for communication from home to schoolto enable the parents or family members to submit feedback indicating their viewsand suggestions about the homework with the science teachers.Finally, parentsare to append their signaturesto the homework sheet to signify their involvement in the homework.

2.10 Non-interactive Real Life Homework

The non-interactive real life homework on the other hand has the same content as the interactive real life homework but they have no reminders for the pupil or family member concerningparticipation. There is no information to the parents, no communications or questions from home-to-schoolinitiating participation of family members in the activities. Also parents are not required to append their signature to any activity sheet.

2.10.1 Non-Interactive Real Life Science Format

The non-interactive real life homework sheet has the following format which,though similar to interactivereal life homework, has no prompt for parental involvement or participation. It has objective(s) that give details about the learning goal of the activity. Materialsthat are cheap and easily obtained at school or home are used. Theprocedure leads the pupil gradually on how to go about the assignment andspace is provided for laboratory report or data chart for pupil to report findings.The conclusion guides the pupil in discussing result(s) and real life application of science.

2.11 Parents' Socio-economic Status (SES)

Socio-economic status is a major determinant of the kind of life a child lives, whether one of hardship or comfort(Ogunsola and Adewale, 2012). This however does not preclude a child from a poor family from succeeding neither does ithighly esteem the one from a wealthy family to automatic success. The socio-economic status of a family is based on the income, educationalbackground and occupation of the parents(Suresh, 2012).

It has been noted that child issues are associated with parent'ssocio-economic status. Parents with higher income, excellent occupation and better education can affordto give more time to their children and supply other necessities to support child development (John and John, 2012). The socio-economic status of a family plays a very significant role in the education of a child(Ahmad and Khan, 2012).Families with a high or average socio-economic status usually have parents who are literates, andadequatelyinformed to assist their children in school related activities. Such parents are aware of the resources at their disposal and how to use them to createan academic environment suitable for learning for their children.They provide relevant books and materials, experienced tutors, well lit reading areas with table and chair and educational toys (Kumar, 2012).High socio-economic status families are knowledge seekers,frequently looking out for information to assist them toequipand make their childrenready for school.

On the other hand, parents with lowsocio-economic status are at a less favourable state in terms offinance, social status, and educational background. Low SES can produce parents who have minimal idea about crucial issues like nutrition and childhood immunizations or about community resources.At times, when parents of low SES want to render assistance to their children in school, they find it difficult because they lack the ability(Ahmad and Khan, 2012). Barry (2006) suggested that parental involvement may heighten thevariation between low and high achieving students;especially,when the achievement gap is related with socio-economic status.Families may find it difficult getting involved in homework if they have limited financial means.

A significant contributory factor to the growth and development of academic skills is the home environment. Woolfolk, (2007) posited that providing improved quality experiences in the home can add up to half of the measured achievement in mathematics, reading and verbal skills.The duty of training a child is in the hands of the parents(Ogunshola and Adewale, 2012). This is in tandem with the submissions of sociologists that education in the home can be an instrument of culturalchange. Whatever affects the education of a child invariably will have effect on the environment anddevelopment of the child.The academic performance of children is affected by the socio-economic status of their parents. Children from low socio-economic statusare unlikely to be at par with their counterparts from high socio-economic background under the same condition of learning (Hill et al. 2004).Smith, Fagan and Ulvund (2002)

maintained that parental socio-economic statusis a significant predictor of academic performance at the primaryclasses.

Parental SES could also affect children in schoolin bringing about adaptability to adjustment of the agenda of the school (Guerin et al., 2001). Oni (2007) and Omoegun (2007) reported that the rates of deviant behaviouris significant among students from high and low socio-economic statuses.The review of other researches also pointed out that children from households and communitieswith low socio-economic status develop academic skills more slowly compared to children from highsocio-economic status (American Psychological Association,2014).Students attending poorly funded schoolsfrom low socio-economic backgroundperform less than students from high social class (Eamon, 2005). This further proves that social class can have either positive or negative effects on academic achievement.

Students' emotional and social functioning depend much on thetone of the parent-student interactions which also affectsachievement and homework completion rate (Pomerantz, Moorman, and Litwack, 2007; Van Voorhis, 2011). Van Voorhis (2011) reportedPomerantz, Grolnick and Price(2005) study on homework experience. They found that parents of junior high school students who show support towards their academics, have children exhibiting less outburst of behavior. Parents also reported that if the teacher directed them well, they would help their children more at home especially if the children are in the elementary and middle grade classes.

Some other studies centered on the social class of parents instead of socio-economic status. In the study comparing the working class and middle class communities in first grade classrooms, Lareau (1987) found thatparents in the middle class community,because of enhanced skills, income, type of occupation and availability of time,help their children more than the working class parents. Mothers from the middle class, having a better educational background, promotedparticipation and confidence in their children which translatesinto academic success and a more positive attitude towards learning (Reay,2004). Increase in financial resources among the middle class parents, raises the motivational support given to their children, resulting in the children having high educational aspirations (Barry, 2006).

Grolnick(2003); Fantuzzo, McWayne, Perry and Childs(2004) have also shown that time spent on childcare varies across families and is found to be positively connected with

socio-economic background. This further proves that more educated parents spend more time on educational childcare than less educated parents (Houtenville and Conway, 2008). This alsoimplies thatassigning homework to pupils is strengthened byparental input at home. Pupils from favourable home backgrounds learn and do more of their homework assignments than pupils from disfavoured home backgrounds. A positive relationship was also found between parental involvement, socio-economic status and student's achievement (Desimone, 1999).The higher the parent's income, the higher the parental involvement. This results inan increase in students'performance in mathematics and reading.

2.12 School Type

School type in this study is defined in terms of ownership, whether it is owned by private individuals or by the government. Schools are set up for the main reason of teaching and learning. Studies onthe effects of schools on student achievement indicate that achievement of students in school is related to school type. Students in public schools do not perform as well as those from private schools.This have been attributed to differences in availability of funds, academic organization, experience and normative environments (Lee and Bryk, 1993). Quality of school facilities andachievementof studentsin English and Mathematics werealso affirmed to have a positive relationship (Cynthia and Megan, 2008).

Parents opinion about their choice of private school is based on the premise that, parents will improve the academic activities of their children by choosing private schools. The idea of a positive private school effect emanates from a body of research that suggests that private schools do better than public schoolsbecause private schools give more homework assignments than public schools and have stricter policies on submission.Lee, Bryk and Smith (1993) found that Catholic schools have academic advantage, which they attributed to a more cohesive academic and social environment in such schools. Isiugo-Abanihe and Labo-Popoola (2004) investigated the extent to which school location and schooltype have significant impact on students' achievement in English language. Their findings reported that students inpublic and private schools in urban and rural locations have significant differences in achievement. This was also supported by Falaye and Onayingbo (2009) who also examined the influence of location and school type on students' achievement and attitudes towards geography. They revealed that

students from private schools performed significantly better than students from public schools. This significance may be due to better facilities and equipment on ground in private schools compared to public schools.

Academic performance of pupils in science has been attributed to the type of schools (private or public) such pupils attend (Corten and Dronkers, 2006). Class size and school type are dual factors thatgo hand in hand in affecting the achievement of students.Private schools,because of better funding,tend to have smaller class size than public schools (Crosnoe, Johnsonand Elder, 2004). This additional funding in private schools leads to acquisition of sophisticated and modern technological tools and resources to enhance academic achievement. Smaller class size, also, creates more teacher-student bonding that brings a positive change in student's performance.Odetoyinbo, (2006)posited that school type is a factor influencing how pupils use technology. Pupils in private schools, as a result of better and modern learning facilities, are more exposed to technological equipment than those in the public schools.

2.13 Empirical Review

2.13.1 InteractiveReal Life Homework and Pupils' Achievement in Basic Science

One way by which help and support can be provided for parents by teachers is through the use of interactive real life homework that enables parents towork systematically with pupils, using similar concepts and skills in line with what is being learnt in school. This is done in such a manner that parents and teachers collaborate. The teachers provide school support, while the parents give the home backing (Hunnell, 2017). In a studycarried out over a 4-month period, comparing sixth and eighth grade science students that were assigned interactive homework and those assigned non-interactive homework, Van Voorhis (2003) reported that students who had interactive homework identified with their parents frequently.The parents are alwaysinvolved in their science homework assignments while those whose parents were rarely,or never involved in their science homework assignmentshad no interactive homework experience.Thirteen percent of studentswho completed interactive homework as against non-interactive homework, reported being able to talk to a family member about their science work.In another study carried out exploring the effects of family members' inclusion in homework completion; using a two-year longitudinal study of mathematics

achievementamong urban elementary school families (Van Voorhis, 2011), family members were asked to comment on their impressions and stance on the assistance rendered to their children to complete their mathematics homework. Majority of familiesreported that the exercise brought out positive responses in them with the use of interactive homework, while only fewparents responded positively among the non-interactive group.This report made the researcher to resolve that irrespective of the educational level or family income, completing homework can bebeneficialtostudents when parents are purposefully included (Van Voorhis, 2011). Likewise, studies haveshown thatstudentsat the risk of poor performance and those with special needs perform better with more parental assistance using interactive homework(Hoover-Dempsey et al., 2001).

Bailey, Slivern, Brabhamand Ross (2004) in theirevaluation project, used interactive homework to assist parents in supporting their children's homework on readingandto specificallydraw inferences from the materials been read. Inthe first school,training was given to parents on how toassociate with children during interactive homework activities. Inthe second school,there was no training for parents but students were given interactive homework assignments. In the third school, students completed the homework activities required without parental training. It was found out that the group whoseparents were involved in trainingperformed significantlyhigher on a test of inference compared to other groups of students. These parents also affirmed experiencing joy while helping their children. Theyconfirmed that the experimentassisted in no small way torealize that participating in their children's learning has much influence on their performance. It is the primaryobligation of parents and teachers to support pupils in school to do their best. The major determinants of what happens in the classrooms are the teachers. By providing meaningful homework, they set the stage for their pupils to work on and apply what they were taught in the class. Theyneed to create room for children and their parents to collaborate on home work.Teachers do this by designing homework in a manner that spurs students tocomplete the assignment on time and afford all concernedthe opportunity to gain from the assignment (Epstein, Salinas and Van Voorhis, 2001). Studentsare alsorequired to be actively andindividually involved in the homework assignment. This personal participationassists students to improve their retention skill andmastery of the subject (Sullivan and Sequeira, 1996). The implication of this is that students must engage in

deliberate activities during the lesson periods so that they would maximally benefitfrom the lesson and transfer it to their homework at home. This to a great extent implies that allowing students to apply skills to real life situations in a meaningful way needs the creation of assignments by teachers to stretch the learning process beyond the classroom.

For students tobe aware that the quality of their work is significant, given homework should be purposeful. Teachers shouldas much as possible lay premium on the quality of the assignment by giving students feedback regarding the homework. To achieve this, feedbacks, prompt checking and marking of homework,writing their comments and returning same to the students is paramount. Some teachersgo over the homework in class whileothers allow the students to check their own work. Thispractice is endorsed by the research finding which posits that students who check their own homework in class have higher achievements (De Jong, Westerhofand Creemers, 2000). With this result,teachersneed to exercise caution inplanning their homework to ensure students are guaranteed maximum opportunities.Inadequate and ineffective homework will produce little or no positive influence on achievement.

2.13.2 Interactive Real Life Homework and Pupils' Scientific Attitude

Research reports(Osborne, Simon and Collins, 2003) hasindicated positive correlation between achievement in science, student-centred instructional designs and scientific attitudes. Beliefs about science as a phenomenon and scientists often impact on the perception of science as a field,and on future career prospects as well as classroom participation. Students whohavepositive mindset tend to display rapt attention to classroom instruction and get more actively involved in science activities. Oluwatelure (2010) believes that an effective synergy involving the triads of parents, teachers and the community will eschew disliketowards schoolwork,thereby contributing significantly to children's learning of science both at school and at home. Olatoye and Ogunkola (2008) alsoafffirm that parental participation facilitates achievement in science and enhances a positive attitude to science.

Development of the pupils' scientific attitude is imperative.Mokoro, Wambiya and Aloka(2014) opined that there is a strong relationship between high academic achievement and scientific attitude. They were of the notion that the work environment of today requires the acquisition and utilization of requisite scientific and technological skills to keep abreast of development and remain relevant. In essence,education must be

re-focused on appropriatelearning experiences, to widen skills,increaseproductivity,improve employability and thereby curtail penury and joblessness among individuals at the prime of life (Adesoji, 2008; Mokoro, Wambiya and Aloka, 2014).

2.13.3 Non-Interactive Real Life Homework and Pupils' Achievement in Basic Science

Non-interactive real life homeworkis carried outand dischargedby the student without anyparticipation or support from parents (Bailey, Slivern, Brabhamand Ross, 2004). It is similar to interactivereal life homework but lacksrequests, cues, reminders and discussions for parents. The non-interactive real life homework does not make use of prompts for pupils to involve their parents in the homework. Olatoye and Ogunkola (2008)reported low meanscoresfor pupilswhose parents'participation areminimal. The implication of this is that the lower the parental participation;the lower the scientific attitude of pupils and the lower the academic achievement of such pupils in science. Olatoye and Ogunkola (2008), opined that the low enthusiasm of pupilsin relation tolearning at school as well as the low inspiration from some parents may negatively impart on their children and resultin low academic performance.

2.13.4 Non-Interactive Real Life Homework and Pupils' Scientific Attitude

In science, attitudes are significant because a child's mind set often connotes a state of mental readiness for the subject matter to be learnt. A positive mind set will prime the mind of learners to perceived science objects, topics, activities, and people positively.Conversely, a child who is uninterested, may be unwilling to relate with individuals and phenomena associated with science.Preparedness,as a variable, takes place unconsciously in a child without any forethought or outward consent. Attitudes are equally acquired and arranged contingent uponexperiences garnered over time as children develop. In addition, a child's mental outlook can be modified through experience. Teachers and parents have the most remarkable influence on the pupils' scientific attitudes (Katz, Kaplan and Buzukashvily (2011). The implication of this is that when childrenare deeply involved in their science homework and parents are not actively participating, the children may have the erroneous impression that the subject is difficult and as a result develop a negative attitude which may impede success in science subjects.

2.13.5 Practice Homework and Pupils' Achievement in Basic Science

Practice homework is that type of homework done after a lesson has been taught in the school. The primary aim of this type of homework is to create opportunity for the new learning through practice to ascertain if the desired learning has taken place. Practice homework are end-of-lesson assignments given to pupils without any content or guidelines on parental involvement. It usually does not have any prompt for parental involvement.

2.13.6 Parents' Socio-economic Status and Pupils' Achievement in Basic Science

Occupying children with tasks at homeis a way by which children learn(Oloruntegbe, 2012). Children perform better academically and show attitudes that are positive when parents associate at homewith their learning. Oloruntegbe (2012) opined that children from low socio-economic background,who frequentlyparticipate in chores and other jobslike farming and hawkingfind it difficult to relateactivities performed at home and the science taught in school.when equated with children from rich background. They exhibitedpoor attitudes towards science and have low academic achievement compared with their counterparts from high socio-economic background.

In aresearchassessing the effect of socio-economic status on academic achievement, Barry(2006), found that test scores soared higher with high socio-economic status of students. In the assessment carried out by the National Center for Education Statistics (NCES) using a standardized test on reading and mathematicssubjects,it was found thattest scores increased significantly when parents participated in their children's schooling. Similarly, Dotson, Kitner-Triolo, Evans, and Zonderman (2009)notedthat African Americans and Whitesascertain the impact of socio-economic status and/or race on cognitive abilities, using test scores from both low and high socio-economicgroups.Theyfound out that for African Americans withlow socio-economic status,proficiency in literacyis a better predictor of cognitive abilities than level of education. They also found that when students from low socio-economic status enrol in a programme that encourage adult support, they had higher levels of academic performance.

2.13.7 Parents' Socio-economic Status and Pupils' Scientific Attitude

Persons belonging to both high or low socio-economic class of the society utilize the knowledge of science in one form or another.Communities or families with low socio-economic statuswant to provide their children with requisite academic backup but lack the time and the financial power.Such parents find it difficult to afford educational resources such ascomputers, relevant books or tutors.Perhaps, the reason why Nigerian students have not done creditably well in science is that they have not developed the right attitudes. Great achievement in both the cognitive and psychomotor domains, to a large extent, depends on the affective domain. Carin and Sund (2005) posited that the degree to which the scientific attitudes are manifested by the scientist as he carries out his investigations determines how well he will be able to utilize the processes to make significant discoveries. Gauld and Aukins (2000)viewed scientific attitudes as a complex number of intellectual processes or dispositions to respondsystematically to a new or hard-to-comprehend situation. These attitudes include: rationality, curiosity, open-mindedness, aversion to superstition, objectivity, intellectual honesty, humility and suspended judgment. To develop scientific attitude in students, they should be provided with hands on experiences (Nzewi, 2008 and Nwosu, 2008). Activity-based approaches provide students with hands on experiences which also helps in developing their scientific attitudes.

2.13.8 School Type and Pupils' Achievement in Basic Science

Studies on the effects of school type on students' academic performance are inconclusive. School type,either public or private, did not have any significant effect on students' academic achievement (Pomerantz and Price, 2005). School type however,has a marked variation on students' academic achievement (Ajayi, 2006).Philias and Wanjobi (2011) stated that school type, (single sex or co-educational; public or private) has effect on the performance of students in Mathematics.

Reasons for unsatisfactory academic performance of learners has been attributed toownershipof school and shortage of infrastructure and facilities. Facilities include all materials and equipment that are used right away or at a later time for the purpose of promoting learning. They also entailthe school'sphysical structure such as classrooms, school decorations and paintings, laboratories, staff offices, libraries,workshops, laboratory materials, audio-visual equipment, playground,electricity, water supply,

furniture, stationeries, play materials and other items possessed by the school. Schoolsin dire needof facilities may not likelyattain their intended goals. When materials are obtainable, accessible and usedskilfully, they promote studying, allowing it to be purposeful and interesting. Educational facilities are absolutely necessaryas they aid education.

Physical facilitiescannot be eliminated because of their importancein schools. Facilities like classrooms,furniture, modern laboratories, toiletsand libraries are to be preserved in schools. Availability offacilitiesalso benefits the teachers and show the level of dedication and creativity towards effective lessondelivery (Adesola,2005).Facilities have been noted as acontributing factor to major academic performances in school (Akinfolarin,2008). Availability of facilities has a significant relationshipwithstudents' performance (Ayodele, 2000 and Vandiver, 2011). In terms of availability of facilities and human resources, private schools perform better and therefore yield higher students' achievement than public schools.This is one reason why many parents sign up their wards in private schools to the loss of public schools.

To this end, there is need to renovate and repair old buildings, chairs and desks, repaint faded walls, restock libraries and laboratories, acquire modern classrooms and generally, give schools a new face lift at regular intervals (Alimi, 2007).

2.13.9 School Type and Pupils' Scientific Attitude

A school with highly populated students may result in the teachers not being able to monitor the performance of the students and thus, reduce the students' academic performance. Most excelling students emerge from private schools.The breakdownin the public educational sector and the consequent fall in the standard of education in Nigeria paved the way for an easy intervention of private schools, which serves as a saving grace for the falling standard of education.

Many public schoolshave certain peculiarities such as: dilapidated buildings, lack of amenities, failing structures, teachers with outdated methodology and information, back log of unpaid salaries, examination malpractice, lack of planning and unmotivated teachers. All these have a negative effect on the students' academic achievement as they may not be able to compete with their private school counterparts. Private schools, in making available a conducive learning environment for the students,promote positive effect on pupils' performance academically.

2.14 Appraisal of Literature

A review of empiricalstudies carried outto assess the correlation betweenstudents' homework and academic performancereveal a positive relationship. Though, homework was given to students in the reviewed studies, none considered the effect of using interactive real life homework, with the moderating variables of parents' socio-economic status and school type on achievement at the primary school level.

Other studiesinvestigatedinteractive science homework that involvedparents' participation and its effect on academic performance. It was found that the homework typeadvanced higher levels of parental involvement than non-interactive assignments. Also, there was a higher homework completion and return rate and higher science grades from studentsallotted interactive homework than those with non-interactive homework.Since the studies were done outside Nigeria, there is need to replicate the study here in Nigeria.

In another study comparing the achievement of public and private school fourth graders in Mathematics, it was found that when students' socio economic status was taken into cognisance, students attending public schools performed significantly better than students at private schools. Though, school type was looked into in this study, there was no report showing how school type could affect the homework given to pupils.

The issue of scientific attitude was also looked into. Several studies have been carried out on pupil's attitude to various subjects, science inclusive. Not much has been done in the area of using interactive homework in developing scientific attitude in pupils. There is need to conduct more research on ways by which pupils' acquisition of scientific attitude can further be enhanced with homework.

Furthermore, of all the reviews on interactive homework, none considered relating homework with real life experiences and situations of pupils especially in the science class. Though studies have been carried out on the effect of homework on academic achievement, none was found on the effect of interactive real life homework on academic achievement and scientific attitude with the moderating variables of parents' socio-economic status and school type. It is against this background that this study therefore seeks to fill this gap by investigating two modes of real life homework and pupils' learning outcomes in basic science.

CHAPTER 3
METHODOLOGY

The methodology of the study is presented in this chapter. Specifically, it discusses the research design, variables in the study, population, sample and sampling technique, instruments and their validation processes, procedure for the data collection and method of data analysis.

3.1 Research Design

The study adopted a pretest-posttest control group quasi-experimental design. The outlay of the instructional strategies employed and the pretest-posttest notations are shown below: -

O_1 X_1 O_2 Experimental Group 1 (Interactive Real Life Homework)
O_3 X_2 O_4 Experimental Group 2 (Non-Interactive Real Life Homework)
O_5 X_3 O_6 Control Group (Practice Homework)

Where

O_1, O_3 and O_5– represents pretest measures

O_2, O_4 and O_6 – represent posttest measures

X_1 represent experimental group 1 (Interactive Real Life Homework)

X_2 represent experimental group 2 (Non-Interactive Real Life Homework)

X_3 represent group 3 Control group (Practice Home Work)

3.2 Factorial Design

A 3 x 2 x 2 factorial design was used and is as shownin Table 3.1:

Table 3.1:3 x 2 x 2 Factorial Matrix Design

	TREATMENTS					
Parents' socio-economic status	Experimental group 1		Experimental group 2		Control group	
School type	Public	Private	Public	Private	Public	Private
High						
Low						

Experimental group 1- Interactive Real Life Homework

Experimental group 2- Non-Interactive Real Life Homework

Control group- Practice Homework

3.3 Variables in the Study

3.3.1 Independent Variables

Homework which was manipulated at three levels namely:

(a) Interactive Real Life Homework
(b) Non-interactive Real Life Homework
(c) Practice Homework (control)

Practice homework was used as control because it is the most commonly used type all over the world and in Nigerian schools (Ogunsanwo, 2003).

3.3.2 Moderator Variables

Two moderating variables were used. These are:

(a) Parents' socio-economic status operating at two levels:
   i. High
   ii. Low

(b) School type also occurred at two levels:
   i. public
   ii. private

3.3.3 Dependent Variables

There were two dependent variables:

(a) Achievement in Basic Science and
(b) Scientific attitude.

3.4 Selection of Participants

The target population for this study comprised all primary schools in Abeokuta South Local Government Area of Ogun State, South-West Nigeria. The participants in the study were drawn from primary six pupils in Abeokuta South Local Government. Multi-stage sampling method was used. Schools were classified into two strata- public and privatein Abeokuta South Local Government Area of Ogun State. At the 1st stage, stratified random sampling was used to select ten schools covering both public and private. At the second stage, simple random sampling was used to select the six schools that participated in the study: three (government) public primary schools and three private primary schools in Abeokuta South Local Government Area of Ogun State. From

these selected schools, primary six classes were purposively chosenbecause they were the terminal class which marks the completion of primary education.The decision to make use of primary six classes was also based on the belief that majority of the pupils in the classes would be able to read printed materials and express their ideas in simple English with little assistance from the teachers and the researcher.

Furthermore, our educational policy stipulates primary level of education as education given in an educational institution for children between the ages of 6-11 plus; eleven-year olds are most likely to be in primary six. These are children,according to Piaget's stages of cognitive development,in the concrete operational stage at the verge of crossing over to the formal operations stage. Therefore, the method of instruction employed at this stage should give children the opportunity to observe, measure, group, classify and make deductions. These activities help make the transition to the formal operations stage smoother and easier for the children (Okoruwa, 2007). In the primary classes,children are more shaped by family values and abilities and parents are more, often than not, involved in their children's work (Jeynes, 2007). The classes used were assignedrandomly to treatment and control groups. Pupils in all the classes that participated had not been taught the selected topics used in this experiment. The experiment was carried out in the first ten weeks of the first term. Intact classes were used in all the schools selected so as not to disrupt the schools programme.

The schools involved were co-educational,having pupils in primary six classes and far from each other in terms of distance to avoid experimental treatment diffusion. A total of 236 pupils from both public and private selected schools participated in the study.

3.5. Research Instruments

For this study, the following instruments were used:

i. Family Socio-Economic Status and Involvement in homework questionnaire (FSESIHQ)

ii. Pupil's Participation in Homework Questionnaire (PPHQ)

iii. Scientific Attitude Questionnaire (SAQ)

iv. Basic Science Achievement Test (BSAT)

v. Interactive Real Life Homework Sheet (IRLHS)

vi. Non-interactive Real Life Homework Sheet (NIRLHS)

vii. Practice Homework Sheet (PHS)

viii. Interactive Real Life Homework Sheet Instructional Guide (IRLHSIG)

ix. Non-Interactive Real Life Homework Sheet Instructional Guide (NIRLHSIG)

x. Practice Homework Sheet Instructional Guide (PHSIG)

3.5.1 Family Socio-Economic Status and Involvement in Homework Questionnaire(FSESIHQ)

This was adapted by the researcher from Green (2007). The researcher modified the structure of the statements.In the response format, some changes were made in the second part of the questionnaire to include responses of: *very true of me, true of me, rarely true of me* and *not true of me*. It was completed by a family member of each participating pupil to ascertain their socio-economic status (their level of education and occupation) and their level of involvement with their wards as well as their experiences,views and impressions of and with the interactive weekly science homework. It was divided into two parts: the first part consists of close ended questions relating to the family member's socio-economic status such as: *age, sex, number of children, marital status, level of education, occupation, average number of weekly working hours*. The other part of the questionnaire was connected to parents' involvement with their child's homework. For each statement on the second part, respondents picked one of the four responses: *very frequently, frequently, less frequently* and *not frequently* (Appendix 3).

3.5.2 Validation and Reliability of Family Socio-Economic Status and Involvement in Homework Questionnaire (FSESIHQ)

The instrument was given to experts in of psychology at the International Centre for Educational Evaluation in order to establish its content validity. Some items were re worded for clearer understanding. After due corrections, the instrument was thereafter pilot tested on the parents of 100 pupils from schools similar to the target samples. The reliability coefficient of the instrument was established using Cronbach Alpha which yielded a value of 0.80. This shows that the instrument was highly reliable.

3.5.3 Pupil's Participation in Homework Questionnaire (PPHQ)

This was adapted by the researcher from Green (2007). The instrument was placed on three point Likert scale for scoring as follows: *Always-3, Sometimes-2* and *Never-1* from a Yes or No statement. Each participating pupil completed it. The PPHQ was separated into two parts. Part A, which was the demographic section had information about the pupil's name, school, age, class, sex and family background while part B had items showing the pupil's level of participation in homework. (Appendix 4).

3.5.4 Validation and Reliability of Pupil's Participation in Homework Questionnaire (PPHQ)

The PPHQ was given to three post-graduate students in the Early Childhood Educationfield and two lecturers, each in science education and Early Childhood Education units respectively for face and content validity. They were also given to primary six science teachers to assess their suitability to primary six pupils. Necessary modifications were made and then pilot tested on 100 pupils in Abeokuta North LGA that were not participating in the study but have similar characteristics with those of the pupils that participated in the experiment to determine the reliability coefficient. A reliability coefficient of 0.79 was obtained using the Cronbach alpha method.

3.5.5 Scientific Attitude Questionnaire (SAQ)

This study used a modified version of Development of Scientific Attitude in School (DSAS) by Amjad and Muhammad (2012). The original DSAS was administered on tenth grade students to assess the development of scientific attitude.The instrument was a student questionnaire. Eight key elements of scientific attitude were contained in the questionnaire: rationality, curiosity,willingness to suspend judgment, critical mindedness, open mindedness,objectivity, humility and honesty. It consisted of 8 parts with 40 items rated with a 5-point Likert scale. The researcher modified the originalversion to allow for the sample in this study. The 40 item DSAS was reduced to 4 parts with twenty items and the response from 5 to a 2-point Likert scale. Some of the statements were also modified, for example in curiosity the statement *'Would you like to run the circuit again by melting a fuse in your home?'* was changed to *'Would you like to know why a maggot changes into a housefly?'* Some of the statements/items were adjusted to suit the level of the pupils used and to include examples peculiar to pupils'

environment. It was answered by each pupil. The instrument consisted of four parts with twenty items which were meant to measure the level of development of four scientific attitudes namely: curiosity, rationality, critical mindedness and honestyin line with the objective (v) of teaching Primary Science in the revised edition of the National Core Curriculum for Primary School Science, which states "to develop a scientific attitude including curiosity, critical reflection and objectivity". Each of these attitudes comprised five statements and there were two categories of responses- Yes or No with a value of 1 for Yes and 0 for No. The researcher did not use observation schedule in this study to avoid unbiased observers as in certain cases,as observers can make those being observed uncomfortable. When it relates to children,the presence of an observer sometimeschanges what is happening in the situation.Another reason is because of the duration used in carrying out this experiment as observation is extremely time consuming, taking into cognisance the large number of pupils involved. The questionnaire was used to find out the extent to which scientific attitude was being developed in the pupils (Appendix 2).These are attitudes regarding the nature of science and its participants which are more of feelings than actions. This necessitated the use of questionnaire than observation.

3.5.6 Validation and Reliability of Scientific Attitude Questionnaire (SAQ)

SAQ was given to two lecturers in the science education unit as well as two experienced primary six science teachers for content validity. They were to read and ascertain any difficulty or ambiguity in the statements. The 40 item DSAS was reduced to 4 parts with twenty items and the response from 5 to a 2-point Likert scale. After necessary corrections were made, the SAQ was administered to 100 pupils in primary six in Abeokuta North LGA that were not participating in the study but have similar characteristics with those of the pupils that participated in the experiment. The reliability was determined using the Cronbach Alpha and a reliability coefficient of 0.88 was obtained.

3.5.7 Basic Science Achievement Test (BSAT)

The researcher designed the BSAT to measure the pupils' achievement in Basic Science. It was based on the contents of the 9-year Basic Education curriculum of Basic Science and Technology for primary six produced by Nigeria Educational Research and Development Council (NERDC) and Universal Basic Education Commission UBEC

(2007) for the Federal Ministry of Education. The topics covered in this study are: Drugs, Sky and the Earth, Force and Simple Machines. The test had twenty items which were multiple choice with four options (A-D) that were based on the learning objectives addressed by the lessons. The items were to measure the pupils' ability to recall facts, understand and apply these facts in real life situations. It also assessed the level of acquisition of scientific concepts. The questions were based on three cognitive levels of knowledge, comprehension and application. The test items were manuallyscored. Each correctly answered item was awarded one mark while a wrong answer was awarded a zero score. Each pupil's total score was considered as the level of achievement of the pupil. (Appendix 21).

Table 3.2: Table of Specification for Basic Science Achievement Test (BSAT)

Content Area	Knowledge (recall) 50%	Comprehension (understanding) 20%	Application 30%	Total
Drugs	(3) 6, 7,9	(1) 17	(1) 8	5
Sky and the Earth	(3) 1, 3, 5	(1) 4	(1) 16	5
Force	(2) 2, 13	(1) 15	(2) 12, 14	5
Simple Machines	(2) 10, 18	(1) 11	(2) 19,20	5
	10	**4**	**6**	**20**

3.5.8 Validation and Determination of Reliability Coefficient of BSAT

Twenty-five items with four options (A, B, C, D) were initially constructed. These were given to a test and measurement expert, two lecturers in science and early childhood education units respectively as well as two primary six teachers who have been teaching science in primary schoolsfor a minimum of two years. They were asked to estimate the content validity as well as suitability of each item for primary six pupils. Recommendations from these experts were used to remove five questions from the items leaving a total of twenty questions for BSAT. The items were administered to 100 basic six pupils from schools similar to the target samples in Abeokuta North Local Government Area to establish the difficulty index of each item. The Kuder-Richardson Formula (KR_{20}) was used to establish the reliability coefficient of 0.75 and an average item difficulty index of 0.46.

3.5.9 Interactive Real Life Homework Sheet (IRLHS)

The interactive real life homework sheet was designed by the researcher. Each participating pupil's family in the interactive real life homework group was sent a letter of consent at the beginning of the experiment to allow their ward to participate in the experiment. The significance of pupils' getting their family members involved in parts of the homeworkwas stressedin the interactive real life groups' letter. Each IRLHS had a brief information to the parent, guardian or family member explaining the homework topic and the skill(s) stressed. Parents, guardians or family members were requested to sign on each IRLHS. The assignments in these worksheets involved finding out day to day facts, that would enable the pupils understand and apply the topic learnt to real life situations. Each IRLHS includes specificgoals for learning, directions on how to complete it and precise instructions to the pupil detailing the involvement of family members in parts of the homework. Pupils were given three days for completion of the assignment to allow enoughtime forfamily involvement in spite of their work schedules. Interactive real life homework sheets were assigned on Mondays and submitted on Thursdays of the same week. Specific sections of the IRLHS gave guidance to involving family members on what was being learnt and engaging them in real life applications of skills and topics. Questions in IRLHS were designed to be interactive such that family members can contribute without being an expert in the science areaor having a detailed or formal knowledge of the topic. The IRLHS also includes a part for home to school

communication. Parents provide feedbackon the effectiveness of the activities and the satisfaction or challenges derived from it. (Appendices 9, 12, 15 and 18).

3.5.10 Interactive Real Life Homework Sheet Instructional Guide (IRLHSIG)

This guide was designed to help teachers execute the interactive real life homework strategy. It includes the following steps:

Step 1: Teacher discusses content of the new lesson.

Step 2: Teacher asks oral questions from pupils on what has been taught.

Step 3: Teacher writes content notes on the board and asks learners to write in their notebooks.

Step 4: Teacher gives interactive real life homework sheets to the pupils. Each interactive real life homework sheet contains:

i. A brief information to the parent/family member on the topic.
ii. Homework content that includes: objectives, materials, procedure, laboratory reports and conclusion.
iii. A prompt that serves as a reminder for the pupil to allowand get the parent/family memberinvolved in the homework.
iv. A home-to-school communication that serves as a feedback from home to the school.
v. Questions on the sheet to encourage involvement of parents/family members.

Step 5: Parent/family member appends signature on each sheet.

3.5.11 Validation and Reliability of the Interactive Real Life Homework Sheet (IRLHS) and Instructional Guide (IRLHSIG)

The interactive real life homework sheet(IRLHS) and instructional guide (IRLHSIG) were given to three post-graduate students in the field of early childhood education and a lecturer each in science education and early childhood education for content validity. They were also given to four primary six science teachers to assess their suitability to primary six pupils. They were required to give their recommendations on the suitability for the homework. Also, they were asked to check areas such as clarity of the questions and or project to be done, whether or not the exercises were interactive for the lessons that will be taught and how it can be applied to real life situations. They were also to

check if the exercises gave enough hands-on activities that would facilitate the learning of science contents each time and if learners would be helped to socially construct the understanding of the science concepts with their family. The instrumentwas revised based on their necessary corrections, comments and suggestions.

3.5.12 Non-Interactive Real Life Homework Sheet (NIRLHS)

The Non-Interactive Real Life Homework Sheet (NIRLHS) was also designed by the researcher. The NIRLHS had activities and content thatare similar toIRLHS but it had no reminders for the family or pupilconcerning involvement. Also, there were no brief information to the parents, no section on feedback from home to school and no questions requiringpupils to involve parents or family members in their discussions or experiments (Appendices 10, 13, 16 and 19).

3.5.13 Non-Interactive Real Life Homework Sheet Instructional Guide (NIRLHSIG)

This guide was designed to help teachers execute the Non-Interactive Real Life homework strategy. It includes the following steps:

Step 1: Teacher discusses the contents of the new lesson.

Step 2: Teacher asks oral questions from pupils on what has been taught.

Step 3: Teacher writes content notes on the board and asks learners to write in their notebooks.

Step 4: Teacher gives non-interactive real life homework sheets to the pupils. Each non-interactive real life homework sheet has:

i. letter to the parent/family member.

ii. Homework content that includes: objectives, materials, procedure, laboratory report and conclusion.

iii. No reminders for the pupil to involve the parent/family member in the homework.

iv. No home to school communication that served as a feedback from home to the school.

v. No question on the sheet to encourage involvement of parent/family member.

Step 5: Parent/family member does not append their signature on each sheet.

3.5.14 Validation and Reliability of the Non-Interactive Real Life Homework Sheet (NIRLHS) and Instructional Guide (NIRLHSIG)

The non-interactive real life homework sheet(NIRLHS)and instructional guide (NIRLHSIG) were also given to three post-graduate students in the early childhood educationfield and a lecturer each in Science Education and Early Childhood Education departments to assess the content validity. They were given to four primary six science teachers to assess their suitability for primary six pupils. The teachers were required to give their recommendations on the suitability of the homework. Based on their comments and suggestions, some items were recast to avoid ambiguity. Their comments and contributions were used to modify the items to ascertain their validity.

3.5.15 Practice Homework Sheet (PHS)

The PHS was designed by the researcher. The normal homework mostly used at the end of the lesson to review questions and exercises meant to reinforce what had been taught in the class were on the sheet. It included no reminders for the family or pupilconcerning involvement. Also there were no information to the parents, nofeedback from home to school, no questions urging pupils to involve parents or family members in their discussions or experiments andno parent's signature (Appendices 11, 14, 17 and 20).

3.5.16 Practice Homework Sheet Instructional Guide (PHSIG)

This guide was designed to help teachers execute the practice homework strategy. It includes the following steps:

Step 1: Teacher discusses content of the new lesson.

Step 2: Teacher asks oral questions from pupils on what has been taught.

Step 3: Teacher writes content notes on the board and asks learners to write in their notebooks.

Step 4: Teacher gives Practice homework sheet to the pupils. Each Practice homework sheet:

i. Does not have a letter to the parent/family member.

ii. Does not have any content; only end of lesson review questions.

iii. Does not have a prompt for the pupil to requirethe involvement of the parent/family member in the homework.

iv. Had no home-to-school communication that served as a feedback from home to school.

v. No question on the sheet that encouraged involvement of parent/family member.

Step 5: Parent/family member does not append their signature on each sheet.

3.5.17 Validation and Reliability of Practice Homework Sheet (PHS) and Instructional Guide (PHSIG)

The practice homework sheet(PHS)and instructional guide (PHSIG) were given to three post-graduate students in the early childhood educationfield and a lecturer each Science Education and Early Childhood Education departments for content validity. They were also given to primary six science teachers to assess their suitability for primary six pupils' science homework. The instruments were revised in line with their recommendations.

3.6 Field Testing of Instruments

A field test was carried out to ascertain the reliability of the instruments and also to point out any shortcoming that might arise in the course of the study. This test was carried out on 100 basic six pupils in both public and private primary schools in Abeokuta North local government area of Ogun state that were not participating in the study but have similar characteristics with those of the pupils that participated in the experiment. All instruments

tested were found reliable.

3.7 Procedure for the Study

Visiting the schools forpermission, familiarization and support was done in the 1st week of the experiment. Letters were written to head teachers of the schools used to seek theirapproval and the cooperation of the teachers and pupils participating in the study. After the approval was secured, teachers were selected.

3.7.1 Training of Research Assistants

In the 2nd week,schools were selected into the experimental and control groups. Research assistants that participated in this study were also trained. The research assistants were the regular science teachers in the primary six classes in the schools. They were all trained in their individual schools at separate intervals.All teachers selected were willing to be part of the study.

During the training sessions, information was given to teachers about the objectives of the study. They were acquainted with the respective homework types they were expected to use (interactive real life homework, non-interactive real life homework or practice homework). Instructional guides were made available to them after the training. The researcher explained the steps involved in each homework type.This was followed by demonstration lessons by the researcher. Teachers were allowed to ask questions and comment on the lessons, instructional guides and homework sheets. Issues raised were discussed and clarified. Thereafter, the teachers carried out their own micro teaching during which each of them taught the lesson. The researcher assessed the teachers and gave suggestions on how to overcome any difficulty that may be encountered while teaching. Both teachers and pupils in each selected school were unaware of what was going on in other selected schools.

Copies of consent letter for parents (see Appendix 1) were given out to pupils in Experimental Group 1 for their parents or family members. This letter introduced the purpose of the interactive real life homework and requested parentsto be involved in the study. Parents were to append their signatures if they agreedto be involved to signify their consent to help their wards. Not all pupils that took the letters home returned them. Only those pupils that returned the consent letters participated in the study. Though, all pupils in the class were taught the topics, only those whose parents consented were given the interactive real life homework sheets.

3.7.2 Treatment Implementation

The administration of pretest of SAT and SAQ to all pupils involved in the study came up in the 3rd week. Teaching and giving of homework sheets were done within the 4th-9th week while the 10th week was used for the administration of posttest of SAT, SAQ, family socio economic status and involvement in homework questionnaire (FSESIHQ) as well as pupil's participation in homework questionnaire (PPHQ).To ensure the trained teachers adhered to the instructional guides, the same lesson plan was used in all the

schools for uniformity of content on each of the topics to be taught but with different homework interventions. The researcher also went round the schools to check the teachers to ensure conformity and implementation of the instructional guides and homework sheets. Six schools were used – 3 public and 3private. Two schools made up a group (a public and a private). The Experimental Group 1 worked with interactive real life homework sheets. Experimental Group 2 worked with non-interactive real life homework sheets while the last group (control) used the practice homework sheets.

The experimentation spanned a total of 10 weeks. Table 3.3 shows the schedule of activities for the experimentation.

3.8 Data Analysis

Analysis of covariance (ANCOVA) was used to determine the significant main and interaction effects with pretest scores as covariates. This statistical tool was chosen because it has the tendency to partial out initial differences among the groups especially since intact classes were used. Estimated marginal mean (EMM) was used to find the magnitude of the differences among the groups while Sidak's Post hoc test was used to disentangle any significant interaction effects. The hypotheses were tested at 0.05 level of significance.

Table 3.3: Schedule of Activities for Experimentation

Week	Activities
1st	Visitation to schools to meet with the head teachers, basic science teachers and pupils
2nd	Training of research assistants (basic science teachers) and selection of schools for experimental and control groups
3rd	Administration of pretest SAT and SAQ on the participants.
4th-9th	Treatment (Interactive Real Life homework, Non-interactive Real Life homework and Practice homework, Control)
10th	Administering posttest SAT, SAQ, family socio economic status and involvement in homework questionnaire (FSESIHQ) and pupil's involvement in homework questionnaire (PPHQ).

CHAPTER 4
RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the results of data analyses as well as discussion on them. The results are presented in the order in which the hypotheses were stated in chapter one of this study at $p < 0.05$ level of significance.

H_{01a}:There is no significant main effect of treatment (homework types) on pupils' achievement in science.

Table 4.1: Summary of 3x2x2 Analysis of Covariance (ANCOVA) of posttest pupils' achievement in Science

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	880.778[a]	12	73.398	10.027	.000	.350
Intercept	469.255	1	469.255	64.107	.000	.223
Pre score	430.820	1	430.820	58.857	.000	.209
Main Effects						
Treatment group	64.008	2	32.004	4.372	.014	.038
Socio-economic	3.164	1	3.164	.432	.512	.002
School type	14.792	1	14.792	2.021	.157	.009
2-way Interactions						
Treatment * parents' socio-economic status	11.622	2	5.811	.794	.453	.007
Treatment * school type	.672	2	.336	.046	.955	.000
Parents' socio-economic status * school type	5.821	1	5.821	.795	.373	.004
3-way Interactions						
Treatment * parents' socio-economic status * school type	11.930	2	5.965	.815	.444	.007
Error	1632.320	223	7.320			
Total	47297.000	236				
Corrected Total	2513.097	235				

a. R Squared = .350 (Adjusted R Squared = .316)

Table 4.1 shows the summary of Analysis of Covariance (ANCOVA) of pupils' posttest achievement scores in science by treatment (Interactive Real Life Homework, Non-Interactive Real Life Homework and Practice Homework). The table reveals that after adjusting for the covariates, (pretest score in SAT), the main effect of treatment on pupils' achievement in science was statistically significant, $F_{(2,223)}= 4.372$, $p< 0.05$. Consequently, the null hypothesis which states that there was no significant main effect of treatment on pupils' achievement in science was rejected. The table further shows that the Partial Eta Square (η^2) was .038, which was considered to be low effect size. The implication of this is that 3.8% of the variance experienced in pupils' achievement in science was accounted for by the treatment.

In order to determine which group differs significantly among the three treatment groups, Sidak's post-hoc analysis was done. The results are presented in tables 4.2 and 4.3. The tablesfurther reveal that there was a significant difference in the pupils' achievement test scores in science between the participants in IRLH ($\bar{x} = 14.114$) and Control ($\bar{x}$=12.660). Also, NIRLH ($\bar{x}$=14.094) differs significantly from the Control ($\bar{x}$=12.660). There exists no significant difference between the mean scores of IRLH ($\bar{x}$=14.114) and NIRLH ($\bar{x}$=14.094).

H_{01b}: There is no significant main effect of treatment (homework types) on pupils' scientific attitude

Table 4.2: Estimated Marginal Means of Pupils' Achievement in Science by Treatment

Treatments	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
IRLH	14.114[a]	.317	13.490	14.739
NIRLH	14.094[a]	.325	13.453	14.735
Practice homework control	12.660[a]	.423	11.825	13.494

Table 4.3: Pairwise Comparison of Pupils' Achievement in Science by Treatment

Dependent Variable: Posttest

(I) Treatments	(J) Treatments	Mean Difference (I-J)	Std. Error	Sign [b]	95% Confidence Interval for Difference [b]	
					Lower Bound	Upper Bound
IRLH Group	NIRLH Group	.020	1.000	-1.067	1.108	.020
	Control Group	1.455*	.023	.155	2.755	1.455*
NIRLH Group	IRLH Group	-.020	1.000	-1.108	1.067	-.020
	Control Group	1.435*	.024	.144	2.725	1.435*
Control Group	IRLH Group	-1.455*	.023	-2.755	-.155	-1.455*
	NIRLH Group	-1.435*	.024	-2.725	-.144	-1.435*

Table 4.4: Summary of 3x2x2 Analysis of Covariance (ANCOVA) of Post-attitude to Science

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	201.835[a]	12	16.820	2.936	.001	.136
Intercept	540.320	1	540.320	94.331	.000	.297
Pre-attitude	16.477	1	16.477	2.877	.091	.013
Main Effects						
Treatment	24.007	2	12.004	2.096	.125	.018
Socio-economic	14.328	1	14.328	2.501	.115	.011
School type	45.803	1	45.803	7.996	.005	.035
2-way Interactions						
Treatment * socio-economic	17.577	2	8.789	1.534	.218	.014
Treatment * school type	28.252	2	14.126	2.466	.087	.022
Socio-economic * school type	25.951	1	25.951	4.531	.034	.020
3-way Interactions						
Treatment * socio-economic * school type	14.892	2	7.446	1.300	.275	.012
Error	1277.330	223	5.728			
Total	43337.000	236				
Corrected Total	1479.165	235				

a. R Squared = .136 (Adjusted R Squared = .090)

The result on Table 4.4 indicates that there is no significant main effect of treatment on pupils' scientific attitude. Therefore, the null hypothesis $H_0$1b was not rejected. The Partial eta square of 0.018 implies that the treatment (Interactive real life homework, Non-interactive real life homework and Practice Homework) accounts for 1.8% of the observed variance in the post-attitude of pupils to science.

H_{02a}: There is no significant main effect of parents' socio-economic status on pupils' achievement in science

Table 4.1 shows that parents' socio-economic status does not have a significant main effect on pupils' achievement in science. Therefore, the null hypothesis which stated that there is no significant main effect of parents' socio-economic status on pupils' achievement in science was not rejected. The partial Eta square, (η^2 = .002),means a low effect size. The implication of this is that parents' socio-economic status accounted for 0.2% of the variance experienced in pupils' achievement in science.

H_{02b}: There is no significant main effect of parents' socio-economic status on pupils' scientific attitude

From Table 4.4 it was revealed that the main effect of parents' socio-economic status on pupils' scientific attitudewas not statistically significant. Therefore, the null hypothesis that there is no significant main effect of parents' socio-economic status on pupils' scientific attitude was upheld. The Partial eta square of 0.011 implies that parents' socio-economic status only accounts for 1.1% of the observed variance in the post-attitude of pupils to science. It was further revealed from table 4.5 below that pupils from high socio-economic status had a higher mean score in scientific attitude ($\bar{X}$= 13.617) than their low socio-economic status counterparts with a mean score of ($\bar{X}$= 13.047).

Table 4.5: Estimated Marginal Means and Standard Error of Parent's Socio-economic Status

Parent's socio-economic status	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Low	13.047[a]	.267	12.521	13.574
High	13.617[a]	.241	13.141	14.092

H_{03a}: There is no significant main effect of school type on pupils' achievement in science

Results on Table 4.1 show that there is no significant main effect of school type on pupils' achievement in science.Consequently, Hypothesis 3a was not rejected. The estimated Eta square reveals that school type contributed 0.9% of the variance observed on pupils' achievement in science.

H_{03b}: There is no significant main effect of school type on pupils' scientific attitude

The result on Table 4.4 indicates that there is significant main effect of school type on pupils' scientific attitude $F(1,223) = 7.501$; $p<0.05$. The null hypothesis H_{03b} was therefore rejected. The implication of this is that school type has significant main effect on the scientific attitude of pupils in primary school. The Partial eta squared of 0.035 implies that school type only accounts for 3.5% of the observed variance in the post-attitude scores of pupils' attitude to science. Table 4.6 shows that the scientific attitude posttest score of pupils from public schools is higher ($\bar{x}$ = 13.874) than that of pupils from private schools ($\bar{x}$ = 12.790). It is therefore evident that pupils from public schools had a higher posttest scientific attitude than pupils from private schools.

Table 4.6: Estimated Marginal Means and Standard Error of School Type

School type	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
public school	13.874[a]	.230	13.420	14.328
private school	12.790[a]	.292	12.216	13.365

H_{04a}: There is no significant interaction effect of treatment and parents' socio-economic status on pupils' achievement in science.

From table 4.1, it was revealed that the interaction effects of treatment and parents' socio-economic status on pupils' achievement in science was not statistically significant. The null hypothesis which states that there is no interaction effect of treatment and parents' socio-economic status on pupils' achievement in science was therefore not rejected. It implies that the effect of treatment on the pupils' achievement in science is not sensitive to parents' socio-economic status. The partial Eta square (η^2) = .007, confirms a very low effect size. This means that less than 1% variance in pupils' achievement in science was accounted for by the interaction effect of treatment and parents' socio-economic status.

H_{04b}: There is no significant interaction effect of treatment and parents' socio-economic status on pupil's scientific attitude.

Table 4.4 shows that interaction effect of treatment and parents' socio-economic status has no significant effect on pupils' scientific attitude. Therefore, the null hypothesis 4b was not rejected. This means that the interaction of treatment and parents' socio-economic status does not influence the pupils' scientific attitude.

H_{05a}: There is no significant interaction effect of treatment and school type on pupils' achievement in science

As shown in Table 4.1, interaction effect of treatment and school type has no significant effect on pupils' achievement in science. Therefore, the null hypothesis which states that there is no significant interaction effect of treatment and school type on pupils' achievement in science was not rejected. The partial eta square of .000 implies that interaction effect of treatment and school type accounts for 0% of the variance in the posttest scores of pupils' achievement in science. This means that the interaction effect of treatment and school type on pupils' cognitive achievement does not influence the pupils' achievement in science.

H_{05b}: There is no significant interaction effect of treatment and school type on pupil's scientific attitude.

Table 4.4 shows that there is no interaction effect of treatment and school type on pupil's scientific attitude. The null hypothesis was therefore not rejected. It can be concluded that there is no significant interaction effect of treatment and school type on pupils' scientific attitude.

H_{06a}: There is no significant interaction effect of parents' socio-economic status and school type on pupils' achievement in science

From table 4.1, it can be seen that the interaction effects of school type and parents' socio-economic status on pupils' achievement in science was not statistically significant. Hence, the null hypothesis which states that there is no significant interaction effect of school type and parents' socio-economic status on pupils' achievement in science was not rejected.

H_{06b}: There is no significant interaction effect of parents' socio-economic status and school type on pupil's scientific attitude.

The result on Table 4.4 indicates that there is significant interaction effect of parents' socio-economic status and school type on pupils' scientific attitude $F_{(1,223)}= 4.531$; $P<0.05$. Hypothesis 6b was therefore rejected. The partial eta square of 0.020 implies that parents' socio-economic status and school type only accounts for 2.0% of the observed variance in the post-attitude score of pupils' attitude to science.

Table 4.7: Estimated Marginal Means and Standard Error for Parents' Socio-Economic Status and School Type

Parents' socio-economic status	School type	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Low	public school	13.202[a]	.301	12.608	13.796
	private school	12.892[a]	.445	12.016	13.768
High	public school	14.545[a]	.335	13.886	15.205
	private school	12.688[a]	.371	11.957	13.420

a. Covariates appearing in the model are evaluated at the following values: pre-attitude = 13.32.

Table 4.7 above shows that pupils with low parents' socio-economic statusin public schools have better attitude towards science (13.202) than pupils in private schools (12.892). Also, public school pupils from high parents' socio-economic background show a positive attitude towards science (14.545) than pupils in private schools (12.688).

H_{07a}: There is no significant interaction effect of treatment, parents' socio-economic status and school type on pupils' achievement in science

Table 4.1 shows that there was no significant interaction effect of treatment, parents' socio-economic status and school type on pupils' achievement in science. It can be concluded that there is no significant interaction effect of treatment, parents' socio-economic status and school type on pupils' achievement in science. Hypothesis 7a was therefore not rejected. This implies that treatment, parents' socio-economic status and school type have no interaction effect on pupils' achievement in science.

H_{07b}: There is no significant interaction effect of treatment, parents' socio-economic status and school type on pupil's scientific attitude

Table 4.1b shows that there was no significant interaction effect of treatment, parents' socio-economic status and school type on pupils' scientific attitude. It can be concluded that there is no significant interaction effect of treatment, parents' socio-economic status and school type on pupil's scientific attitude. The partial eta squared of 0.012 implies that treatment, parents' socio-economic status and school type account for 1.2% of the observed variance in the post-attitude scores of pupils' attitude to science. Hypothesis 7b was therefore not rejected. This implies that treatment, parents' socio-economic status and school type had no effect on pupils' scientific attitude to science.

4.2 Discussion of findings

4.2.1 Main Effect of Treatment on Pupil's Achievement in Science and Scientific Attitude

The main effect of the two modes of homework (Interactive real life homework and Non-Interactive real life homework) on pupils' cognitive achievement in science was significant. In other words, the findings indicate a better achievement of pupils in the experimental groups than those in the control group. A possible reason for this may be because the pupils in the experimental groups were helped to understand better the

contents of what they were taught while involving their parents. Each topic was linked with real life experiences for pupils. Pupils could see, feel, touch, handle and have first-hand experience with the materials alongside their family members. Certain sections of the homework sheet prompted parents to get involved. This parental involvement aided learning in the pupils as learning was made practical. This isrelated with the National Policy on Education (2014) which indicates that science should be taught in practical ways. Also the significant main effect of treatment may be ascribed to the fact that children become active learners when they show family members what they are being taught in the class. The result of this study corroborates that of Voorhis (2003), Voorhis and Epstein (2002), Hill and Taylor (2004) who in their separate findings, point to the fact that pupils' achievement improved significantly when they were given homework. The findings of this study, which point at the effectiveness of interactive real life homework more than non-interactive real life homework, contradict the findings of Quade (2010) who established that high school Spanish students benefited minimally from home work in terms of achievement but parental involvement had a positive impact on completion of homework.

Supporting this work further, are the quasi-experimental and longitudinal studies that were carried out on the effectiveness of the Teachers Involve Parents in Schoolwork (TIPS) programme, where interactive assignments that call for the involvement of parentswere given. It was found that participation of parents in TIPS improved students' scores significantly in writing(Esptein, Simon, and Salinas, 1997),science class grades andhomework grades (Van Voorhis, 2003). Other evidence supporting the relative effectiveness of parentalparticipation in homework, intimates that preparing a comfortable place, a set and regular time for doing homework, andgiving guidance with homework are ways by which parents can promote achievementeffectively (Afolabi and Audu, 2007). Pomerantz, Grolnick and Price (2005) asserted also that categories of parental involvement that aid the independence of a child andallow for precise, clear and coherent guidelines about homework are most effective. This is in consonance with the findings of this study in which Interactive real life homework had specific guidelines for parents' involvement.

Interactive real life homework encouraged significantly more family participation in science homework. Parents were directed on giving specific helpwith homework to their children and how much help isconsidered appropriate. When family members were

involved, pupils completed more with greater accuracy than pupils with non-interactive assignments. This conclusion agrees with Van Voorhis (2003) suggestion that these pupils may have added knowledge by discussing and exchanging ideas about their work in anorderlymanner with a family member.

The findings of this study agree with other research reports that pupils who do homework perform better than pupils who do not. Parental involvement also aidedthe rate of completion,which also enhanced achievement. Pupils have a positive experience with homework and find it more enjoyable when parents participate. When parents are involved, pupils affirm that they paymore attention and have a more positive feeling (Bempechat, 2004), they enjoy doing and completing their homework (Cooper, 2007) and find their homework activities as more achievable (Cooper, Robinson and Patall, 2006). Pupils benefits and derive satisfaction from anyhomework that is more pleasurable. Greater achievement may also be enhanced through parental participationas it gives room for pupils toexpress theirdesireswhile the parents offer their support accommodating thebehaviours sought after in homework (Hoover-Dempsey et al., 2001). Communication gap betweenteachers and parents is reduced as both work hand in hand for the progress of the child.(Epstein, Salinas and Van Voorhis, 2001).

Parental involvement is also important for pupils who need monitoring and are in the process of developing self-management and study habits. Parental involvement in homework may also influence achievement for a long time and promote pupils' ability to engage in adaptive self-regulation, affective and cognitive development,management of resources and available time needed for achieving academic goals (Zimmerman, 2000).

Furthermore, the better performance by the interactive real life homework group than the control group can be attributed to the fact that this type of homework is different from the conventional homework. Moreover, this homework is allotted once weekly and pupils have the privilege of taking several days for completion to give enough time for family members involvement. Feedback provided by parents of the interactive real life homework group on the effectiveness of the activities for them and their children also revealed to a great extent, the satisfaction derived. Comments sent back to school showed that parents support and enjoy interactive real life homework. The control group had lower mean scores compared to the interactive real life homeworkand non-

interactive real life homework group. This supports Grant (1987) in Ogunsanwo (2003) that children do not enjoy monotonous activities. Ogunsanwo (2003) further expressed that practice homework does not make learning interesting to pupils. It is mainly aimed at keeping children busy and satisfying their parents' desire to engage children at home. The control group (practice homework) was the least effective on pupil's achievement in science. This may be because teachers in this group encouraged minimal participation of parents. This confirms the submission of Ojedokun (2010) thatlearners are not urged to critically think and apply their knowledge in solving real life problems while relying on thecontinuous use of conventional instructional strategies. Rosario (2015) also opined that the most effective homeworkin aiding mathematics achievementare those that provideextension beyond what has been learnt in class during the school hours. Although the focal point on homework is practice, that is students do exercises to reinforce exactly what they learned in class, the findings of this study disclosed that homework activities should increase the scope of teaching and learning done in the schools beyond the usual end of lesson exercises.

The results of this study indicate that the treatment has no significant main effect on pupils' scientific attitude. This implies that the treatment did not affect pupils' scientific attitude as expected. This may be attributed to the affective nature of attitude which may take a long period of time to manifest since the experiment was less than three months. Also, it may be a pointer that other variables, aside from homework, contribute to development of scientific attitudes. This finding negates that of Ogunsanwo (2003) who found significant difference in the attitude scores after children were exposed to homework and when children prepare before the lessons took place. They are more likely to enjoy the lesson than when they did not have any prior knowledge.

4.2.2 Main Effect of Parents' Socio-economic Status on Achievement in Science and Scientific Attitude

There is no significant main effect of parents' socio-economic status on pupil's achievement in science. This implies that parent's socio-economic status does not present an advantage or disadvantage to the learner when it comes to their achievement in science. This may be so because treatment in the study provided a guideline for any parent to be involved easily in pupils' homework irrespective of the socio-economic status. 'Parents' in this study refers to not only the biological parents but guardians,

adoptive and step parents, primary caregivers or anybody available to help the child with his homework. Since academic help is not limited to biological parents alone, any adult available can always help the child. This supports the U.S Education (2006) report which established that about seventy percent of parents renderminimum help and support at home to their childrenirrespective of their race, educational backgroundor socio-economic status. Kaylor and Flores (2008) found that students from low socio-economic statusshowed higher levels of effort towards academicswhen they participated in a programme that promoted adult support.It was also revealed that positive parental attitudescan make those from low socio-economic status background gainlike those from high backgroundrather thanestablish a vantage point for highsocio-economic status students exclusively. This means that, parental attitudes that are positivepromote the good of students. Therefore, if parents have positive attitude towards science these children are from a low backgroundcan be inspired to do well.

Another factor that can be attributedto this finding is that Abeokuta South Local Government cuts across both rich and poor, literate and illiteratehomes.Pupils from poor or illiterate homes have constant interactions with those from rich or literate homes.These may, in the process be receiving school related helps from rich or literate homes, which may improve their achievements in science. Furthermore, due to the intermingling of different social classes in the local government areawhere the study was carried out, there was no clear demarcation between the poor and rich; educated and non-educated. There was no exclusively poor or rich area too. Rural/urban migration to this local government area has brought along diverse occupations. As a result, it can be deduced that even though a child comes from a poor or non-educated home, he can still get help from others around. This further brings to light the ability of Interactive Real Life Homework to leverage the gap between high and low socio-economic classes. This supports the position of Ogunsola and Adewale (2012) that parent's socio-economic status have no significant effect on pupils' academic performance.

Tertiary institutions around the local government area used for this work do not have enough accommodation on campus. This forces some of the students to rent off-campus accommodation. Many of the students live amongst low socio-economic families and are readily available to help with the pupils' homework. Lastly, increase in after school care, school lessons and home tution for both pupils from high and low socio-economic status have not restricted the knowledge of pupils to school type and its inherent disadvantages.

A child can take advantage of other educational services available to help with his homework.

However, the findings of this study on parents' socio-economic status differs from that of Suleman, Hussain and Nisa (2012) andJohn and John (2012) that parents' socio-economic status affects pupils' performance. Parents with higher income, better jobs andhigher education can spend more on their children and make other necessities available for the child's comfort and development. These parents are ready, suitable and fit to render the necessary assistance to their child in tasksbrought from school by creating a positive environment for their children, providing books, educational toys, and tools, tutors and well lit reading areas (Suresh, 2012). Barry (2006) also opined that a gap is created in the achievement between high and low achieving students which is associated with parent socio-economic differences. It may be hard for parents to participate and get involved if they are in short supply of resources.

Similarly, parents' socio-economic status does not have any significant main effect on pupils' scientific attitude. This implies that irrespective of parents' socio-economic status the pupils' scientific attitude is the same. Coming from high or low socio-economic background does not have any effect on pupils' scientific attitude.

4.2.3 Main Effect of School Type on Achievement in Science and Scientific Attitude

The findings of this study showed that there was no significant main effect of school type on achievement in science. This indicates that the type of school a pupil is attending does not determine the pupils' achievement in basic science if the appropriate teaching methodology is employed to teach science. With interactive real life homework, parents of pupils from both school types have guidelines on what they need to do to help their wards do their homework. Parents do not have to be knowledgeable in science before they can guide their wards to do their homework. When pupil share ideas on what they learnt in school with parents, they make it easier for parents to help with the homework. Also, because this type of homework is related to skills applied in real life situations, parents of pupils from both school types are able to participate by adding their views and observations. The findings of this study negate that of Lubienski and Lubienski (2006) who compared the achievement of public and private school fourth graders in Mathematics. They found that when students'socio economic background was taken into

account, students attending public schools performed better than students at private schools.

School type had a significant main effect on pupils' scientific attitude. This implies that the scientific attitude of pupils depends on the type of school they attend. The school type is a variable that subsumes a lot of events and practices that could have affected the pupils' scientific attitude. In this study, pupils in public school had a better scientific attitude than their mates in private school. This may be because in public schools, pupilshave experienced and qualified teacherswho are aware that apart from cognitive aspects of science, another product of science that must be inculcated is scientific attitude. Teachers of science are urged to use innovativemethods which promoteactive participation and motivatepupils to find science interesting.

4.2.4 Two-Way Interaction Effect of Treatment and Parents' Socio-economic Status.

The findings of this study showed that there is no significant interaction effect of treatment and parents' socio-economic status on pupil's achievement in science. This implies that when the treatment and parents' socio-economic status are taken together, they did not affect pupils' achievement in science. This shows that pupils with the interactive real life homework will work effectively, irrespective of socio-economic status of their parents. This is because guidelines and prompts are available for pupils regardless of their parents' socio-economic status.

Similarly, there is no significant interaction effect of treatment and parents' socio-economic status on pupils' scientific attitude. When pupils take homework home, teachers allow parents into the experiences of their wards by being part of their schoolwork and playing a major role in pupil's academic activities (Cooper, 2007). When there is direct parental participationin the education of their children, teachers observe that it can accelerate how the childrenstudyor impede theirlearning, if a different method is used at home from to what had been taught in school. Giving a proper measure of aid may assist pupils, but taking over their work and doing it for them, telling them answers instead of giving hints, may affect them negatively(Cooper, 2007).

4.2.5 Two Way Interaction Effect of Treatment and School Type

The findings of this study showed that there is no significant interaction effect of homework types and school type on pupils' achievement in science as well as scientific attitude. This implies that pupils' achievement in science and their scientific attitude are not sensitive to homework types and school type when taken together. This indicates that homework type will improve pupils' achievement effectively irrespective of the school type. The reason attributed to homework improving pupils' achievement is as a result of the extra time spent on practising and extending what has been done in school at home. This allows for better assimilation and also makes learning more permanent. Moreover, homework exercises that were given are practical and are, therefore, important in learning science. This supports the views of Saracho and Spodek (2008) that science activities that are hands-on involving the use of the five sense organs of the body, seeing, hearing, feeling, tasting and smelling, improve pupils learning.

There is no significant interaction effect of homework types and school type on pupils' scientific attitude.Though school type has a main significance on attitude, there is no interaction effect of homework and school type on scientific attitude. It can be deduced that other factorsapart from these two variables, contribute to enhancing a better scientific attitude in pupils.

4.2.6 Two Way Interaction Effect of Parents' Socio-economic Status and School Type on Achievement in Science and Scientific Attitude

The findings of this study showed that there is no significant interaction effect of parents' socio-economic status and school type on pupils' achievement in science. This means that the pupils' achievement is not affected by parents' socio-economic status and school type when taken together. This can be attributed to the intermingling of families from different socio-economic status. Pupils from low socio-economic status can get help from those from of high socio-economic background. Also extra-curricular activities in the school, early morning classes and afternoon lessons are available to help pupils from both socio-economic backgrounds.Lareau, (2000) and Compton-Lilly, (2003) revealed that, regardless of income and occupation of parents, they were found to be involved in their children's education. This study demonstrates that low socio-economic status parents are just as eager to help their children succeed in school as their peers from highersocio-economic background.Lubienski and Lubienski

(2006) compared the achievement of public and private school fourth graders in mathematics. They found that when students' socio-economic status was considered, students attending public schools performed better than students at private schools.

On the other hand, the findings showed that parents' socio-economic status and school type had a significant interaction effect on pupils' scientific attitude. Public school pupils' had a higher scientific attitude irrespective of their parents' socio-economic status. This is an indication that in this study, scientific attitude is affected by the school type and parents' socio-economic status. Pupils ranging between six and fourteenyears ofage are eager to investigate and learn (Ozben, 2006). They want to find out most of the events happening in their environment. Therefore, they ask many questions, explore and look out for materials to feel, hear, touch and even taste. Pupils from high socio-economic homes most times are not given the opportunity for this kind of exploration as they are often locked up within their homes. Parents feel they will soil their clothes if given such opportunities. Pupils from low socio-economic status on the other hand are not usually withheld from exploring their environment. Picking things of interest from the ground, poking into the soil and getting their clothes and hands soiled are not prohibited for them. This may be a reason for public school pupils having a higher scientific attitude than their private school counterparts. Pupils' curiosity should be kept alive and continuous by teachers. This can be done by giving activities that will promote finding solutions, thinking over concepts and keepingalive their curiosity (Ozben, 2006). Such activities can be encouragedin the class as well as at home. Interactive real life homework is one of such activities that can be given to enhance scientific attitudes.

4.2.7 Three Way Interaction Effect of Treatment, Parents' Socio-economic Status and School Type

The findings of this study showed that there is no significant interaction effect of treatment, parents' socio-economic status and school type on pupils' achievement in science and scientific attitude. This implies that pupils' achievement in science as well as their scientific attitude is not sensitive to the treatment, parents' socio-economic status and school type taken together. This also means that each variable; treatment, parents' socio-economic status and school type,is functioning independent of the other, to affect achievement and scientific attitude. Effectivehomework provides a link between what the children already know and what they undergo through activities. Productive

questions advance a student in his thinkingand also enable a teacher to provide scaffolding for students setting out to construct their own understanding.

CHAPTER 5
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of findings

Based on the analysis and the interpretations of the data collected in this study, the following were the summary of the findings:

1. There was significant main effect of treatment on pupils' achievement in basic science but no significant main effect on pupils' scientific attitude. This may be attributed to the affective nature of attitude which may take a long period of time to manifest since the experiment was less than three months.Interactive real life homework was more effective in enhancing pupils' academic achievement than non-interactive real life homework and practice homework.
2. There was no significant main effect of parents' socio-economic status on pupils' achievement in basic science and scientific attitude.
3. There was no significant main effect of school type on pupils' achievement in basic science but a significant main effect was observed on pupils' scientific attitude.
4. There was no significant two-way interaction effect of treatment and parents' socio-economic status on pupils' achievement in basic science and scientific attitude.
5. There was no significant two-way interaction effect of treatment and school type on pupils' achievement in basic science and scientific attitude.
6. There was no significant two-way interaction effect of parents' socio-economic status and school type on pupils' achievement in basic science but there was a significant effect on scientific attitude.
7. There was no significant three-way interaction effect of treatment, parents' socio-economic status and school type on pupils' achievement in basic science and scientific attitude.

5.2 Conclusion

Based on the findings of this study, it was concluded that interactive real life homework is a veritable tool that can effectively improve pupils' achievement in science. Teachers

should strive to create an enjoyable and interesting science experiencewhich pupils will recall for a long time. Science as a process skill that is on-going will extend even though pupils have moved beyond the primary classes. Thus, it becomes necessary to help themcomprehend the significance of science and the import of learning science.

The higher level of parental involvement in interactive real life home work than non-interactive real life homework strategy was also attributed to the slight superiority of interactive real life homework compared to non-interactive real life home work. Receiving help or guidance from parents has enhanced pupils' achievement. A person from a poor home is not condemned to be a non-achiever; he can explore the vast resources in his community to improve his academic achievement. In addition to this, it was concluded that the scientific attitude of pupils is not sensitive to the teaching method used by the teacher of science, rather, it is affected by the type of school the pupils attend. Furthermore, the scientific attitude of pupils is affected by the interaction of school type and parents' socio-economic status.

5.3 Educational Implications of the Findings

The findings of this study have the following educational implications for classroom practices:

1. Improving pupils' achievement in science cannot solely be achieved through the conventional teaching strategy.Therefore,embracing learner-centred instructional strategy, using interactive real life homework that will take teaching and learning of science beyond the classroom is necessary.
2. When learners are made to be actively engaged in doing science, they comprehend better. Teachers should encourage activity-based science lessons and homework.
3. Parents are also enjoined to get involved with their children's school work. Parental participation alongside teaching and learning is very important at the foundation of teaching science to pupils in primary school. Interactive real life homework creates an avenue for parental involvement that enables pupils to share their science work at home.
4. Pupils' scientific attitude can also be developed by practicing science. Schools should help to enforce this by providing equipment, materials and specimensthat

can be used for hands-on experiment and investigations, which they can relate with.

5. Furthermore, curriculum planners as well as policy makers should recommend the use of appropriate interactive real life homework in the basic science curriculum.
6. Book authors should also incorporate interactive real life homework in their science books to engage both pupils and parents at home.

5.4 Recommendations

1. The use of interactive real life homework has proved to have significant positive effect on the science achievement of pupils. Teachers should be provided with proper training in the use of interactive real life homework and be motivated to use it in the classroom regularly.
2. Private and public schools should learn,through interactive seminars and workshops, the type of practices that can make pupils' in their schools have a better scientific attitude.
3. Pupils will benefit more from well-designed interactive homework. Teachers can collaborate in writing such interactive homework that will involve pupils engaging parents or family members indiscussions, interviews,activitiesor experiments. This can be done before the commencement of a new school year.
4. With appropriate guidelines for participation, parents should get involved with their children's school work for better academic performance.
5. Schools should consider utilizing the internet, developing web pages that provide general information to parents about how to be involved in homework as well as give specific information about daily or weekly homework assignments.
6. Schools and teachers should determine effective types of homework and recommend such to parents in orderto promote better achievementof pupils in basic science.

5.5 Contributions of the Study to Knowledge

1. The findings of the study established the fact that interactive real life homework was effective in improving pupils' achievement in science.

2. This study also amplifies the significance of parental participation in pupils' homework.
3. It also shows that the type of school a pupil attends as well as the parents' socio-economic status does not affect their achievement in science.
4. Furthermore, it was established that the homework strategy the teacher adopts does not have any effect on pupils' scientific attitude probably because it is a learning outcome in the affective domain. However, the type of school pupils attendsaffect their scientific attitude**.**

5.6 Limitations of the Study

This study was restricted to a local government area in Ogun State. Since the researcher cannot cover all local government areas, findings may not be a true generalisation on other local government area's in other parts of the country. The study also covered only four topics in basic science because of the short duration of research.

5.7 Suggestions for Further Studies

Future research should focus on the use of interactive real life homework in other subjects at the primary level of education especially the lower primary classes.Other studies should involve more variables such as homework completion, accuracy and amount of time spent on doing homework. Other aspects of science such as science process skills, psychomotor skills, observation and scientific attitudessuch as willingness to suspend judgment, open-mindedness, objectivity and humility should also be looked into. Time spent for the study shouldbe increased to be able to cover more contents.

Similar study could be replicated in other geo-political zones in Nigeria using more local governments, states, schools, teachers and pupils from other classes. A larger population over a longer duration could also be used such that the result rendered could be generalised and scientific attitude could be measured by direct observation.

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APPENDIX 1

Letter of Consent

University of Ibadan
Department of Early Childhood and Educational Foundations

Date:_____

Dear Parent or Guardian,

Letter of Consent to participate in a Ph.D. research work on Interactive Real Life Home Work

I welcome your child/ward to my Primary 6 science class. This term, as part of our school curriculumand objectivesin Basic science, a homework activity sheet named Interactive Real Life Homework (IRLH) will be assigned to your child/ward each week. It involves your child/ward to speak with you and exchange ideas in some parts of the homework. On Mondays, Interactive Real Life homework sheet will be given outto pupils and will be expected for submission on Thursdays of the same week.

Each homework sheethas a partfor you to send your remarks about the homework activities to metagged "Home-to-School Communication" section. By finishing and submitting homework, pupils get the opportunity of keeping abreast with their work and achieving more this term.

For clarifications about the science class or the homework sheet, kindly contact me. I anticipate a great time working with your child/ward in the science class and associating with you towards your child/ward's success this term. Thank you.

Yours,

_____
Primary Six Science Teacher

----------✂----------

Kindly cut along this line and return this part to school through your child/ward, by ___/____/____

Having read the above information,I permit my child/ward to participate in the primary six Interactive Real Life science homework.

_____
Name of Parent/Guardian, Signature and Date

APPENDIX 2

Development of Scientific Attitude Questionnaire

Section A

Name ID: Class_____

School ID:_____ Age:_____ Sex: Boy [ ] Girl [ ]

Section B

Please tick the box to answer the following statements/questions

Curiosity	Yes	No
I like learning science as a subject		
I enjoy doing my science home work		
Doing my science homework has helped me in understanding the subject the more		
Doing practical in science makes me enjoy science class		
Would you like to know why a maggot changes into a housefly?		
Rationality		
I know that taking drugs without the doctor's prescription is dangerous to health		
Would you agree if you were told that washing hands in the rain cripples your hands?		
I would believe it with observation and experiment that the earth is spherical.		
The reason why a cat is black is because it ran across a black motorcycle and had an accident.		
Would you believe that smoking is dangerous to health if you could verify with many observations and experiments?		
Critical Mindedness		
Do you believe in talking without thinking about it first?		
While reading/studying a science topic, do you have questions to ask?		
If you fall ill and the doctor prescribes a drug for you to use, would you ask questions from the doctor about the causes of the illness		
If someone tells you that feeling of irritation on the palm is a sign of getting money, would you demand proofs from that person?		
A doctor carries out a surgical operation on your friend's kidney to remove stones, would you ask questions from the doctor about why and how the stone was made?		
Honesty		
Would you like that teacher who provides help to you in computer practical during examination?		
Would you take money on the floor in your class though nobody is looking at you?		
Would you like to cheat during examination?		
Would you take that prize given to the best science student even though you cheated to pass the examination?		

Would you like to collect more pocket money from your mother after your father had already given you for that day?		

APPENDIX 3

Family Socio-Economic Status and Involvement in Homework

Questionnaire

Dear Parent/Guardian,

This questionnaire is to find out your involvement in your child/ward's homework. Please, kindly fill appropriately.

Instruction: *Please indicate the most appropriate option to the following questions.*

Section A: Family Socio-economic Data

1. Age of family member_____
2. Sex of family member: (a) male (b) female
3. Marital status of family member:
   (a) Single (b) married (c) divorced (d) widow (e) widower
4. Status of family member: (a) father (b) mother (c)sibling
   (d) Other family member (e) Non-family member
5. No of children:
   (a) One [ ] (b) Two [ ] (c) Three[ ]
   (d) Four [ ] (e) Above four [ ]
6. How many children live in your homeunder the age of 18?
7. How many hours per week do you work outside of the house (averagely)?____hrs
8. Level of education (please select highest level completed)
   (a) Primary Six School Leaving Certificate [ ]
   (b) Secondary school [ ]
   (c) College of Education [ ]
   (d) Polytechnic [ ]
   (e) University [ ]
   (f) None [ ]
9. Occupation:_____
10. Are you involved in your child/ward's homework?

(a) Very frequently (b) frequently (c) Less frequently (d) Not frequently

11. Who participates in the homework with your child?
    (a) father (b) mother (c) siblings (d) Other family member
    (e) Non-family member

12. Who is most frequent?
    (a) father (b) mother (c) siblings (d) Other family member
    (e) Non-family member

13. Income per month
    (a) Less than ₦10,000 [ ]
    (b) Between ₦11,000 and₦50,000 [ ]
    (c) Between ₦51,000 and ₦100,000 [ ]
    (d) Between ₦51,000 and ₦100,000 [ ]
    (e) Between ₦101,000 and ₦200,000 [ ]
    (f) More than ₦200,000

Section B

	Very frequently	Frequently	Less frequently	Not frequently
1. My child/ward required me to explain something about his/her schoolwork/homework.				
2. My child/ward asked for my help withhis/her school-related work.				
3. A member of the family talks with my child/ward about what was done in school.				
4. Someone in this family supervises my child/ward's homework.				
5. Someone in this family helps my child/ward prepare for tests.				

	Very true of me	True of me	Rarely true of me	Not true of me
6. I have an idea of how to help my child/ward do well in school.				
7. I don't know how to help my child/ward improve his/her performance at school.				
8. I feel satisfied about the efforts I put in to help my child/ward learn.				
9. I know ways that are effective to contact teachers concerning my child/ward's learning related issues.				
10. I know how to explain things to my child/ward about his or her schoolwork.				

11. I commit adequate time in helping my child/ward with schoolwork				
12. I find it useful talking to teachers/parents about education-related issues				

APPENDIX 4

Pupil's Participation in Homework Questionnaire

Dear pupil,

This questionnaire is to find out your involvement and level of your family participation with your homework.

Name ID: Class_____

School ID:_____ Age:_____ Sex: Boy [ ] Girl [ ]

Section A

1. Who among these people live with you at home all/most of the time?
   (a) Father [ ]
   (b) Mother [ ]
   (c) Siblings [ ]
   (d) Other family members [ ]
   (e) Non-family members [ ]

2. What are your parents' occupations?
   Father
   Mother

3. Which of these basic household items/facility is in your house?

(a) Computers	[ ]	(f) Educative CD's	[ ]
(b) Study desk/ tables	[ ]	(g) DVD players	[ ]
(c) Calculators	[ ]	(h) Microwave oven	[ ]
(d) Book shelf	[ ]	(i) Dictionary	[ ]
(e) Books	[ ]	(j) Internet facility	[ ]

4. What is the educational qualification of your father?
   (a) Primary School [ ]
   (b) Secondary school [ ]
   (c) College of Education [ ]
   (d) Polytechnic [ ]
   (e) University [ ]
   (f) None

5. What is the educational qualification of your mother?

   a. Primary Level [ ]
   b. Secondary Level [ ]
   c. College of Education [ ]
   d. Polytechnic [ ]
   e. University [ ]
   f. None

6. What type of house do you live in?

   (a) One room [ ] (b) Room and parlour [ ]

   (c) Self-contain [ ] (d) Flat [ ]

7. Did your parents build the house themselves?

   (a) Yes [ ] (b) No [ ]

8. Do your parents have car(s)?

   (a) Yes [ ] (b) No [ ]

9. How many people live in your home?_____

Section B

	Always	Sometimes	Never
1. Someone in my family discusses with me about my day in school.			
2. Someone in my family supervises my homework/school work.			
3. Someone in my family helps me study for tests.			
4. I ask someone at home for help if I have problems with homework.			
5. I am interested in school work.			
6. I work hard on homework.			
7. I give up when homework is hard.			
8. I go over my homework for mistakes.			
9. I find a place that makes it easier for me to do homework.			
10. I try to finish hard problems before asking for help.			

APPENDIX 5

Lesson 1 – Home Helpers

Duration: 70 mins

Topic: Machines

Sub-Topic: Home helpers

Behavioural Objectives: At the end of the lesson, pupils should be able to:

1. Define Machines
2. State the uses of home helpers
3. Give examples of simple machines used at home

Instructional Materials: bottles openers, scissors, hammer, hoe, wheelbarrow.

Reference Book: Maggi Alach and Donna Shaw (2012).Macmillan Basic Science for Primary SchoolsBook 6. Macmillan Publications, (Nig.).

Entry Behaviour: Pupils can define machine and list the types of machine.

Lesson Content:

Introduction: Teachers revises the last topic on machine.

Teacher then introduce the new topic by showing the pupils different home helpers.

Development:

Step 1: The teacher defines home helpers

Home helpers can be defined as machines or tools or collection of simple objects joined together used at home which helps to make our work easier and faster. Also home helpers help us to use small amount of energy to do work.

Step 2: The teacher gives examples.

Examples of home helpers include:

1. Bottle Opener
2. Scissors
3. Hammer
4. Electric Blender
5. Knife.

Step 3: The teacher gives reasons for using machines.

Reasons for Using Machines

We use machines to make our work:

a. Faster enough.
b. Easier
c. Neater

Step 4: The teacher state the uses of home helpers

Uses of Home Helpers

1. Bottles opener is used for opening bottled drinks
2. Scissors is used for cutting paper and clothing materials
3. Hammer is used for driving in nails
4. Electric blender is used for blending pepper and fruits
5. Knife is used for cutting food items such as onions, yam e.t.c.

Summary: The teacher summarizes the lesson.

Home helpers can be defined as objects used at home to make our work easier.

Examples includes- Bottles opener, scissors, hammer, electric blender and knife.

Evaluation:

1. What are Home helpers?
2. Mention five (5) examples of home helpers
3. State the uses of home helper.

Assignment:

Pupils are given their homework sheets: interactive, non-interactive and practice.

APPENDIX 6

Lesson 2 – What goes up must come down

Duration: 70 mins

Topic: Force

Sub-Topic: Gravitational Pull

Behavioural Objectives: At the end of the lesson pupils should be able to:

1. Demonstrate that earth exerts a pull on objects and bodies.
2. State the reason why what goes up comes down.

Instructional Materials: a sheet of paper, biro/pencil, a small stone, a piece of chalk, a fruit e.t.c.

Reference Book: Maggi Alach and Donna Shaw (2012).Macmillan Basic Science for Primary Schools Book 6. Macmillan Publications, (Nig.).

Entry Behaviour: Pupils can mention simple machines used at home.

Lesson Content:

Introduction:

The teacher revises the last topic on machine. The teacher then introduces the new topic by throwing one of the objects in the air.

Development:

Step 1: the teacher defines gravitational pull with an experiment.

Experiment: An experiment to show gravitational pull

Aim: To show that what goes up must come down

Materials: a ball, small stone, a piece of chalk.

Method: Move out of the class to an open space then take a piece of stone and throw it upwards into the air. Repeat the same method for the ball and piece of chalk. Record your observation.

Observation: It was observed that the small piece of stone, ball and piece of chalk thrown up returned back to the ground.

Conclusion: The above observation shows that the earth exerts a force or pull which is called gravitational pull.

Gravitational pull is the force of attraction acting upon an object by the earth to its centre.

Summary: The teacher summarizes the lesson.

The reason why whatever goes up comes down is because of gravitational pull present in the atmosphere.

Evaluation:

1. What is gravitation pull?

Assignment:

Pupils are given their homework sheets: interactive, non-interactive and practice.

APPENDIX 7

Lesson 3 – Drugs

Duration: 70 mins

Topic: Drugs

Sub-Topic: Types of Drugs

Behavioural Objectives: At the end of the lesson pupils should be able to:

1. Define drugs
2. List the types of drugs
3. Give examples of drugs

Instructional Materials: Panadol, blood tonic, bitter leaf, salt, kolanut, lime, alcohol.

Reference Book: Maggi Alach and Donna Shaw (2012).Macmillan Basic Science for Primary Schools Book 6. Macmillan Publications, (Nig.).

Entry Behaviour: Pupils can list the materials in the first aid box

Lesson content:

Introduction: The teacher revises the last topic. The teacher introduces the topic by mentioning different kinds of drugs.

Development

Step 1: Drugs

A drug is a natural or artificial chemical substances that we take into the body and can affect the functioning of a living organism.

Step 2: Types of drug

Drug is classified into two main types which are:

1. Natural drugs
2. Manmade or artificial drugs

a. Natural Drugs: These are raw substances taken into the body to care illnesses. Examples include- bitter leaf, kolanut, lime, honey etc.

b. Manmade/artificial drugs: - These are manufactured from raw substances and processed into finished products and then taken into the body. Examples include: paracetamol, Panadol, aspirin, tramadol etc.

Summary: The teacher summaries the lesson.

Drug is any natural or artificial chemical substance that we take into our body and can affect the functioning of the body.

The two types of drugs include: natural and manmade drug. Examples are bitter leaf, kolanut, salt, honey, lime, alcohol, Panadol, Paracetamol, blood tonic.

Evaluation:

1. What are drugs?
2. State the types of drugs
3. List three types of natural and manmade drugs

Assignment

Pupils are given their homework sheets- interactive, non-interactive and practice.

APPENDIX 8

Lesson 4 – Sky and the Earth

Duration: 70 mins

Topic: Sky and the Earth

Sub-Topic: The Earth movement

Behavioural Objectives: At the end of the lesson pupils should be able to:

1. Define Rotation of the earth
2. Define revolution of the earth

Instructional Materials: a torch, medium sized ball, marker, books, a dark room.

Reference Book: Maggi Alach and Donna Shaw (2012).Macmillan Basic Science for Primary Schools Book 6. Macmillan Publications, (Nig.).

Entry Behaviour: pupils can define the term 'Earth'

Lesson content:

Introduction: The teacher introduces the new topic by performing an experiment to show the earth movement.

Development

Step 1: The earth movement

The earth movement is the changing of the earth's position with time. It is also the tuning of the earth within a particular time.

Step 2: Types of movement of the earth

There are two types of movement of the earth namely:

1. Rotation
2. Revolution

1. **Rotation:** This is turning of the earth around its axis within 24 hours. Rotation brings about day and night.

2. **Revolution**: of the earth is the turning of the earth round the sun. The earth takes one year i.e 365¼ days to completely turn around the sun.

Summary: The teacher summarises the lesson. The earth movement is the change in position of the earth with time. The two types of earth movement include: Rotation and Revolution of the earth. Day and night is as a result of the complete rotation of the earth round its axis which takes 24 hours.

Evaluation:

1. What is the earth's rotation?
2. What is the earth's revolution?

Assignment

Pupils are given their homework sheets- interactive, non-interactive and practice.

APPENDIX 9

Interactive Real Life Science Homework – Home Helpers

Name ID: Class_____

School ID:_____ Age:_____ Sex: Boy [ ] Girl [ ]

TOPIC: Home Helpers

Dear Parent/Guardian,

We are learning about objects that help us do work at home. This homework is due for submission on_____.

Yours,

_____

Pupil's Signature

Objectives: To collect and identify simple machines in the home

Materials: bottle openers, scissors, hammer, hoe, wheelbarrow

Procedure:

1. Discuss the following with a family member to communicate what we are learning in class: A machine is a simple object or collection of objects joined together which make our work easier and faster. It helps us to use small amount of energy to do work.
2. With your family member decide which six objects in your kitchen are machines.

Laboratory report:

Write out the six objects in your kitchen which are machines.

	Object	What it is used for
1.		
2.		
3.		
4.		
5.		
6.		

Conclusion

1. Why do we use machines? _____

   Family member's idea _____

2. Can you think of living life without machines?

   How would life be?

   My idea

   Family member's idea

Home-To-School Communication

Dear Parent,

Please give me your opinions about your child/ward's work on this activity. Write YES or NO for each statement.

1. My child/ward clearly understood the homework and was able to complete it.
2. My child/ward and I enjoyed the activity.
3. With this homework, I know what my child/ward is learning in science class.

Any other suggestions _____

_____

Parent's Signature and Date

APPENDIX 10

Non-Interactive Real Life Science Homework – Home Helper

Name ID: Class_____

School ID:_____ Age:_____ Sex: Boy [ ] Girl [ ]

TOPIC: Home Helpers

Objective: To collect and identify simple machines in the home

Materials: bottle openers, scissors, hammer, hoe, wheelbarrow

Procedure:

1) A machine is a simple object or collection of objects joined together which make our work easier and faster. It helps us to use small amount of energy to do work.
2) What six objects in your kitchen are machines?

Laboratory report:

Write out the six objects in your kitchen which are machines.

	Object	What it is used for
1.		
2.		
3.		
4.		
5.		
6.		

Conclusion

3. Why do we use machines? _____
4. Can you think of living life without machines?_____
5. How would life be? _____

APPENDIX 11

Practice Homework - Home Helpers

TOPIC: Home Helpers

1. Define machine.
2. List six objects at home that are machines.

APPENDIX 12

Interactive Real Life Science Homework – Drugs

Name ID: Class_____

School ID:_____ Age:_____ Sex: Boy [ ] Girl [ ]

Homework Topic: Drugs

Dear Parent/Guardian,

We are learning about drugs. This homework is due for submission on .

Yours,

_____

Pupil's Signature

Objectives: To identify the major types of drugs.

Materials: bitter leaf, salt, kolanut, honey, lime, alcohol, panadol, paracetamol, cough mixtures, blood tonic, different types of drugs in our home; both natural and man-made.

Procedure:

1. Discuss with your family member what a drug is. A drug is a natural or artificial chemical substance that we take into the body.
2. Observe drugs in your home: first aid box, living room, kitchen, bedroom. Classify different kinds of drugs in your home. Write a list of these drugs in the lab report.
3. Record in the lab report the drugs that are natural and those that are synthetic.
4. Show your drug list to your family member. Include any other item(s)suggested by your family member.

Laboratory report:

Write out in each column the drugs you found either natural or manmade.

Room	Drug item	Natural	Manmade
Living room	1. 2. 3.		
Dining table	1. 2. 3.		
Kitchen	1. 2. 3.		
First aid box	1. 2. 3.		
Bedroom	1. 2. 3.		

Conclusion

Talk over the following questions and answer them with your family member.

1. What are drugs?_____
2. Which drug in your home is used regularly/often?
   Family member's idea
3. List four food substances that can also serve as drugs

Home-To-School Communication

Dear Parent,

Please give me your opinions about your child/ward's work on this activity. Write YES or NO for each statement.

1. My child/ward clearly understood the homework and was able to complete it.
2. My child/ward and I enjoyed the activity.
3. With this homework. I know what my child/ward is learning in science class.

Any other suggestions _____

_____

Parent's Signature and Date

APPENDIX 13

Non-Interactive Real Life Science Homework - Drugs

Name ID: Class_____

School ID:_____ Age:_____ Sex: Boy [ ] Girl [ ]

TOPIC: Drugs

Objectives: To identify the major types of drugs

Materials: bitter leaf, salt, kolanut, honey, lime, alcohol, Panadol, paracetamol, cough mixtures, blood tonic, different types of drugs in our home, both natural and man-made

Procedure:

- A drug is a natural or artificial chemical substance that we take into the body.
- Observe drugs in your home: first aid box, living room, kitchen and bedroom.
- Classify different kinds of drugs in your home. Write a list of these drugs in the lab report.
- Record in the lab report the drugs that are natural and those that are synthetic

Laboratory Report:

Fill in the drugs you found either natural or manmade in the columns below:

Room	Name of Drug	Natural	Manmade
Living room	1. 2. 3.		
Dining table	1. 2. 3.		
Kitchen	1. 2. 3.		
First aid box	1. 2.		

Room	Name of Drug	Natural	Manmade
	3.		
Bedroom	1. 2. 3.		

Conclusion

1. What are drugs?
2. Which drug in your home is used most times?
3. List four food substances that can also serve as drugs

_____

APPENDIX 14

Practice Homework - Drugs

TOPIC: Drugs

1. What are drugs?
2. State the types of drugs.
3. Write down three types of natural and manmade drugs.

APPENDIX 15

Interactive Real Life Science Homework -

What Goes Up Must Come Down

Name ID: Class_____

School ID:_____ Age:_____ Sex: Boy [ ] Girl [ ]

TOPIC: What Goes Up Must Come Down

Dear Parent/Guardian,

We are learning about gravity. This homework is due for submission on_____.

Yours,

_____

Pupil's Signature

Objectives: To demonstrate that the earth exerts a pull on objects and bodies.

Materials: a sheet of paper, biro/pencil, a small stone, a piece of chalk, a fruit and some water in a bowl.

Procedure:

Discuss and do the following with a family member to communicate what we are learning in class:

1. Come out of your house with your family member, look up. What do you see? The space above the earth that you see is the sky. We all live on the earth, plants, animals, hills, mountains, rocks, rivers. The space containing air which surrounds the whole earth is known as the earth's atmosphere. Within this atmosphere, any object which is thrown up will soon fall back to the ground. This is known as gravity.
2. With your family member, one after the other, hold each object (materials) up in your hand and then release it from your fingers.

Laboratory report:

What happens to each object after being released?

Explain your observations

Conclusion

The earth pulls towards its centre, every object which is situated in its atmosphere. This pull by the earth is called gravitational pull or gravitational attraction.

Do the following with your family member:

a. Put some water in a bowl.
b. Pour out the water from the bowl and observe it as you are doing so.
c. Why does water flow down and not up when poured out of the bowl?_____

_____

_____

d. Why does a fruit drop down and not otherwise from its tree?_____

_____

_____

Talk over the above questions and answer them with your family member.

Home-To-School Communication

Dear Parent,

Please give me your opinions to your child/ward's work on this activity. Write YES or NO for each statement.

1. My child/ward clearly understood the homework and was able to complete it.
2. My child/ward and I enjoyed the activity.
3. With this homework, I know what my child/ward is learning in science class.

Any other suggestions _____

_____
Parent's Signature and Date

APPENDIX 16

Non-Interactive Real Life Science Homework -

What Goes Up Must Come Down

Name ID: Class_____

School ID:_____ Age:_____ Sex: Boy [ ] Girl [ ]

TOPIC: What Goes Up Must Come Down

Objective: To demonstrate that the earth exerts a pull on objects and bodies.

Materials: A sheet of paper, biro/pencil, a small stone, a piece of chalk, a fruit and some water in a bowl.

Procedure:

- Come out of your house, look up. What did you see?
- The space above the earth that you see is the sky. We all live on the earth, plants, animals, hills, mountains, rocks, rivers e.t.c. The space containing air which surrounds the whole earth is known as the earth's atmosphere. Within this atmosphere, any object which is thrown up will soon fall back to the ground. This is known as gravity.
- One after the other, hold each object (materials) up in your hand and then release it from your fingers.

Laboratory report:

- What happens to each object after being released?
- Explain your observations.

Conclusion

The earth pulls towards its centre, every object which is situated in its atmosphere. This pull by the earth is called gravitational pull or gravitational attraction.

a. Put some water in a bowl.
b. Pour out the water from the bowl and observe it as you are doing so.
c. Why does water flow down and not up when poured out of the bowl?_____
d. Why does a fruit drop down and not otherwise from its tree?_____

Write complete sentences.

APPENDIX 17

Practice Homework -

What Goes Up Must Come Down

TOPIC: What Goes Up Must Come Down

1. What is gravitational pull?
2. Why do objects thrown up come down?

APPENDIX 18

Interactive Real Life Science Homework – The Earth Movement

Name ID: Class_____

School ID:_____ Age:_____ Sex: Boy [ ] Girl [ ]

Homework Topic: The Earth Movement

Dear Parent/Guardian,

We are learning about day and night. This assignment is due for submission on_____.

Yours,

_____

Pupil's Signature

Objective: To describe the earth movement and its effect.

Materials:a torch, medium sized ball, marker, a dark room.

Procedure:

Discuss and do the following with a family member to communicate what we are learning in class:

The earth and all other planets rotate and revolve round the sun. There are two types of movement of the earth. They are:

(a) Rotation: this is the turning of the earth around its axis. The earth takes 24hours to complete a rotation. Rotation of the earth brings about day and night.

(b) Revolution: revolution of the earth is the turning of the earth round the sun. The earth takes one year (365¼ days) to completely turn around the sun.

With your family member in a dark room (in the evening with the light off):

1) Place the ball towards the edge of a table.
2) With your marker, put a point on the side of the ball. Identify this point as Nigeria; gently rotate the ball until you see the marked point again. This is one complete rotation movement.
3) Let your family member stand in front of the ball and point the torch towards the ball at the marked point on the ball.

4) Now, gently rotate the ball again while following the marked point with your eye until a complete rotation. Ensure the family member holds the torch firmly and you do not block the ray of light.

Laboratory report:

What did you notice on the sides of the ball when the marked portion wasfacing the torch?

What did you notice on the sides of the ball when the marked portion was off the ray of light?

Conclusion

Discuss and answer this question with your family member.

1. Why do we have day and night? _____

Home-To-School Communication

Dear Parent,

Please give me your opinions to your child/ward's work on this activity. Write YES or NO for each statement.

1. My child/ward clearly understood the homework and was able to complete it.
2. My child/ward and I enjoyed the activity.
3. With this homework, I know what my child/ward is learning in science class.

Any other suggestions_____

_____
Parent's Signature and Date

APPENDIX 19

Non-Interactive Real Life Science Homework – The Earth Movement

Name ID: Class_____

School ID:_____ Age:_____ Sex: Boy [ ] Girl [ ]

TOPIC: The Earth Movement

Objective: To describe the earth movement.

Materials: a torch, medium sized ball, marker, books, a dark room.

Procedure:

The earth and all other planets rotate and revolve round the sun. There are two types of movement of the earth. They are:

(a) Rotation: this is the turning of the earth around its axis. The earth takes 24hours to complete a rotation. Rotation of the earth brings about day and night.

(b) Revolution: revolution of the earth is the turning of the earth round the sun. The earth takes one year (365¼ days) to completely turn around the sun.

In a dark room (in the evening with the light off):

1. Place the ball towards the edge of a table.
2. With your marker, put a point on the side of the ball. Identify this point as Nigeria; gently rotate the ball until you see the marked point again. This is one complete rotation movement.
3. Place your torch on some books and position it such that it points towards the ball at the marked point on the ball.
4. Now, gently rotate the ball again while following the marked point with your eye until a complete rotation. Ensure you hold the torch firmly and you do not block the light.

Laboratory report:

What did you notice on the sides of the ball when the marked portion was facing the torch?

What did you notice on the sides of the ball when the marked portion was off the ray of light?

Conclusion

1. Why do we have day and night?_____

_____

_____

Write complete sentences.

APPENDIX 20

Practice Homework – The Earth Movement

Topic: The Earth Movement

1. Define rotation of the earth.
2. Explain why we have day and night

APPENDIX 21

Basic Science Achievement Test

Name ID: Class_____

School ID:_____ Age:_____ Sex: Boy [ ] Girl [ ]

Instruction: *Please, draw a circle around the correct answer*

1. The sun has_____ planets moving round it.
   (a) 7 (b) 8 (c) 9 (d) 10
2. The force that acts on a mango fruit as it falls to the ground is called__ force
   (a) Electrical (b) gravitational (c) Magnetic (d) mechanical
3. Which of the following material is a source of solar energy?
   (a) Sun (b) Coal (c) Water (d) Wood
4. The smallest and closest planet to the sun is the_____
   (a)Earth (b) Jupiter (c) Mars (d) Mercury
5. How long does it take the earth to make a complete rotation on its axis?
   (a) 27 days (b) 365 days (c) 24 hours (d) 8 hours
6. A drug is_____
   (a) Natural or artificial chemical substance that we take into the body
   (b) What is used in writing
   (c) An ornament worn sound the neck
   (d) A part of the body
7. Excessive use of drugs is called_____
   (a) Attitude (b) training (c) overdose (d) under dose
8. The following are examples of drugs except_____
   (a)Honey (b) salt (c) Paracetamol (d) sand
9. Taking drugs without the doctor's prescription is also known as drug abuse
   Yes [ ] No [ ]
10. A is a device for doing work_____
    (a) Load (b) Machine (c) Effort (d) fulcrum
11. _____ is an example of a simple machine
    (a) Door handle (b) scissors (c) bottle opener (d) all of the above
12. _____causes a pull or push.
    (a) Start (b) stop (c) force (d) heavy load
13. The following are examples of force except
    (a) Frictional force (b) Opposite force
    (c) Gravitational force (d) Magnetic force
14. Force is used in performing the following tasks
    (a) Tearing of paper (b) eating and drinking food
    (c) Opening doors (d) all of the above.

Answer Yes/No to the following questions

15. The force of attraction is called gravitational force	Yes [ ]	No [ ]
16. Revolution of the earth brings about seasons.	Yes[ ]	No[ ]
17. Drug abuse can lead to excellent performances in school	Yes[ ]	No[ ]
18. A pulley is an inclined plane	Yes[ ]	No[ ]
19. Frictional force is the force between two surfaces	Yes[ ]	No[ ]
20. A magnet can attract wood to itself	Yes[ ]	No[ ]