## List of Science and Mathematics Lesson Plans

### Science

<table>
<thead>
<tr>
<th>District</th>
<th>Topic</th>
<th>Page</th>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>P 3 Tano South</td>
<td>Waves</td>
<td>134</td>
<td>Soil</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P 4 Assin North</td>
<td>Waves</td>
<td>136</td>
<td>Water Purification</td>
<td>137</td>
</tr>
<tr>
<td>Akatsi</td>
<td>Source of Energy</td>
<td>138</td>
<td>Interaction of Matter</td>
<td>139</td>
</tr>
<tr>
<td>Adansi North</td>
<td>Grouping of Animals</td>
<td>140,141</td>
<td>Electric Circuit</td>
<td>142</td>
</tr>
<tr>
<td>P 5 Wa Municipal</td>
<td>Types of Soil</td>
<td>143-145</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Akuapem North</td>
<td>Soils</td>
<td>146,147</td>
<td>Heat Energy</td>
<td>148,149</td>
</tr>
<tr>
<td>P 6 Kassena Nankana</td>
<td>Mixtures</td>
<td>150-152</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tamale Metro</td>
<td>153,154</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dangme West</td>
<td>156-158</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Mathematics

<table>
<thead>
<tr>
<th>District</th>
<th>Topic</th>
<th>Page</th>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>P 3 Tano South</td>
<td>Collecting and Handling Data</td>
<td>159,160</td>
<td>Fraction</td>
<td>161</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Measurement of Time and Money</td>
<td>165</td>
</tr>
<tr>
<td>P 4 Assin North</td>
<td>Multiplication of Numbers</td>
<td>162-64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Akatsi</td>
<td>Fraction</td>
<td>166,167</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P 5 Adansi North</td>
<td>Measurements of Length and Area</td>
<td>170</td>
<td>Investigation with Numbers</td>
<td>171</td>
</tr>
<tr>
<td>Wa Municipal</td>
<td>Collecting and Handling Data</td>
<td>172</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Akuapem North</td>
<td>Measurements of Length and Area</td>
<td>173</td>
<td>Factors and Prime Numbers</td>
<td>174-176</td>
</tr>
<tr>
<td>P 6 Kassena Nankana</td>
<td>Shape and Space</td>
<td>177,178</td>
<td>Collecting and Handling Data</td>
<td>179-181</td>
</tr>
<tr>
<td>Tamale Metro</td>
<td>Addition (B.S.2)</td>
<td>182,183</td>
<td>Collecting and Handling Data</td>
<td>184</td>
</tr>
<tr>
<td>Mpochor Wassa East</td>
<td>Fractions</td>
<td>185,186</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dangme West</td>
<td>Investigation of Numbers</td>
<td>187,188</td>
<td>Chance</td>
<td>189</td>
</tr>
</tbody>
</table>
**TANO SOUNTH**

Class: Primary 3  
Subject: Natural Science  

References: MOESS, Sept. 2007  
Primary School Natural Science Syllabus  
Primary School Natural Science Pupil’s book

<table>
<thead>
<tr>
<th>Day/ date/ duration</th>
<th>Topic/ subtopic</th>
<th>RPK / OBJECTIVES</th>
<th>TEACHING –LEARNING ACTIVITIES</th>
<th>TLMs</th>
<th>CORE POINTS</th>
<th>EVALUATION</th>
</tr>
</thead>
</table>
| **Day:** Wednesday  
**Date:** 17/10/07  
**Duration:** 60 mins | **Topic:** Waves  
**Subtopic:** Creating waves | 1. Pupils can beat drums to produce sound.  
2. Pupils have been throwing objects e.g. stones into rivers | *INTRODUCTION:*  
Introduce the lesson through questions:  
1. How does a drum produce sound?  
2. What happens to the surface of a river if a stone is thrown into it? | | | |
| | | **ACTIVITY 1:**  
- Sprinkle some chalk particles on a drum and ask a pupil to beat it while others observe.  
- Ask pupils to observe carefully the movement of the particles. Let pupils talk about the type of movement observed. | **CORE POINT 1**  
Particles on drum which is being beaten move up and down rapidly.  
This motion is called vibration. | Drum  
Chalk  
Particles | Fill in the gaps  
1. When the drum is beaten, the chalk particles move ______ and ______. | |
| | | **ACTIVITY 2:**  
- Give a pan full of water to each group.  
- Ask pupils to beat the side of the pan full of water.  
- Ask pupils to observe carefully the movement of the surface of the water in the pan. | **CORE POINT 2**  
Water produces waves when it is disturbed. | Pan  
Water | 2. Water produces ______ when it is disturbed at one end. | |
| | | **ACTIVITY 3:**  
- Let pupils put a floating object (piece of dry wood) in the middle of the pan full of water.  
- Ask them to beat one side of the pan again vigorously.  
- Let pupils observe carefully the movement of the dry wood and talk about what they see. | **CORE POINT 3**  
The piece of wood moves from the middle to the side of the pan. Energy from the waves moved the piece of wood. Therefore waves carry energy. | Dry wood | 3. ______ carries energy. | |
| | | **APPLICATION**  
Energy from waves help canoes to move.  
Swimmers sometimes make use of energy from waves when swimming. | | | |
| | | **CLOSURE:**  
Summarize the lesson and assign pupils exercises. | | | |

---

Drum  
Chalk  
Particles  
Pan  
Water  
Dry wood
### TANO SOUTH

**Class:** P3  
**Subject:** Natural Science  
**References:** Natural Science Syllabus pg24

<table>
<thead>
<tr>
<th>Day/ date/ duration</th>
<th>Topic/ subtopic</th>
<th>RPK / OBJECTIVE S</th>
<th>TEACHING-LEARNING MATERIALS (TLMs)</th>
<th>TEACHING-LEARNING ACTIVITIES (TLAs)</th>
<th>CORE POINTS</th>
<th>EVALUATION</th>
</tr>
</thead>
</table>
| Day: Wednesday      | Topic: Soil     | RPK: Pupils grow crops in the soil and have seen ants, earthworms, pieces of stones in soils. | TLMs: Sample of garden soil, transparent containers, stick, pencil, worksheet and water. | **INTRODUCTION:** Introduce the lesson by revising pupils RPK through questions.  
1. Where do you grow crops?  
   Expected answer: In the soil.  
2. What are some of the things found in soils?  
   Expected answer: ants, stones, worms, dead leaves.  
**ACTIVITIES:**  
1. Put pupils into groups and provides them with the TLMs.  
2. Let pupils observe a given sample of soil and record the things they can see in the soil sample on work sheets provided.  
3. Guide pupils to fill the transparent containers with the garden soil.  
4. Guide pupils to pour water into the container and observe what happens after a few seconds then stir, shake and allow it to stand.  
5. Pupils observe the different layers of soil and discuss their observation.  
**CLOSURE:** Ask pupils questions to check their understanding of the lesson. | **Composition of soil**  
A given sample of soil contains:  
- Air  
- Water  
- Rock  
Dead plants and animal remains.  
Bubbles of air are seen in the soil | List the components of soil. |

**SAFETY:** Warn pupils not to taste the soil (mixture) and should wash their hands after observing through the soil.
<table>
<thead>
<tr>
<th>Day/ Duration</th>
<th>Topic/ Sub-topic</th>
<th>R.P.K. Objectives</th>
<th>Teaching/Learning Activities</th>
<th>T.L.M.</th>
<th>Core Points</th>
<th>Evaluation/ Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday 24/10/07 60 mins</td>
<td>Waves</td>
<td>Pupils have seen how some Creatures move e.g. maggots, caterpillars, etc.</td>
<td>INTRODUCTION (5 mins) Ask pupils to demonstrate and draw how caterpillar moves. Answer: Caterpillars move up and down</td>
<td>Drum, powder</td>
<td>There is up and down movement from the centre - where the object was dropped - towards the sides of the container</td>
<td>i) What happened to the water surface? The surface moved up and down. ii) When a bigger object was dropped, what happened? The waves move faster. iv) In what direction did the wave move? Away from the source.</td>
</tr>
<tr>
<td></td>
<td>Waves</td>
<td></td>
<td>ACTIVITY 1 Pupils work in groups. Pupils drop small object/ e.g piece of dry wood at the surface of water in a container and observe what happens</td>
<td></td>
<td></td>
<td>v) How did the particles move? Ans. They move up and down away from the source.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ACTIVITY 2 Let pupils pour some powder / chalk particles on a drum and beat it. Pupils observe and describe the patterns made by the vibrating particles.</td>
<td></td>
<td></td>
<td>vi) How did the particles move? Ans. They move up and down away from the source.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ACTIVITY 3 Let pupils tie a rope to a post and move one end up and down and observe what happens</td>
<td></td>
<td></td>
<td>vii) What name is given to the up and down movement of the rope waft surface/particles? Ans. Wave</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ACTIVITY 4 Let pupils observe a light object e .g .a dry leaf on the surface of water.</td>
<td></td>
<td></td>
<td>viii) How do we create waves? Ans. By dropping object in water, move rope up and down etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CLOSURE Discuss with pupils how sound gets to the ear</td>
<td></td>
<td></td>
<td>x) What makes the leaf to move? Ans. Waves</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>APPLICATION Light and tough materials are suitable for drums, speakers, etc.</td>
<td></td>
<td></td>
<td>xi) When do we say somebody/something has energy? Ans. When work is done.</td>
</tr>
</tbody>
</table>

Written exercises
Let pupils draw waves.
## ASSIN NORTH
LESSON PLANS - ASEI & PDSI WORKSHOP

**6th WEEK-ENDING:- 19th October 2007**

**SUBJECT: NATURAL SCIENCE**

**CLASS: B.S. 3**

**NO ON ROLL:** 60  
**AVERAGE AGE:**

**REFERENCES:**  
1. MOE (2007), PRY NATURAL SCIENCE SYLLABUS PP

<table>
<thead>
<tr>
<th>Day/Duration</th>
<th>Topic/Sub-topic</th>
<th>R.P.K. Objectives</th>
<th>Teaching/Learning Activities</th>
<th>T.L.M.</th>
<th>Core Points</th>
<th>Evaluation/Remarks</th>
</tr>
</thead>
</table>
| Tuesday 23/10/07 40 mins | Water Purification | Pupils have been fetching water from different sources  
Objective: By the end of the stipulated time, the pupils will be able to:  
1. Mention at least two methods of purifying water  
2. Demonstrate how to make dirty water clean using filtration (sand bed) method. | INTRODUCTION (5 mins)  
Ask pupils to mention some sources of water in the locality and compare how clean they look.  
EXPECTED ANSWERS  
River, Stream, Bore-hole, pipe-borne. The pipe-borne water looks cleaner | Unclean water, handkerchiefs, cotton wool, (filter paper), empty voltic containers, knife | Methods of purifying Water  
i) Filtration, ii) Boiling, iii) Distillation | Describe how unclean water can be filtered |

**PRESENTATION/DEVELOPMENT (30 mins)**  
1. Ask pupils to mention the various ways of making the dirty looking water(stream water) to look clean  
2. Guide pupils to demonstrate filtration of dirty water using a clean cloth/handkerchief.  
3. Guide pupils to demonstrate filtration using the filter bed/model filter with instructions from a work sheet  
4. Discuss with pupils other methods of making water pure  
**CLOSURE (5 mins)**  
Summarise lesson with the pupils through questions. E.g. Why do people prefer drinking ‘pure’ water to ordinary water?  

**APPLICATION**  
Pupils use knowledge to make dirty water clean for use
### Source of energy

**Objectives:**
- By the end of the lesson, pupils will be able to:
  - 4.1.1.: explain the term ‘energy’.
  - 4.1.2.: identify 4 sources of energy.
  - 4.1.3.: demonstrate two uses of solar energy.

**Introduction:** (5mins)
Teacher asks pupils to give reasons why they eat food.

Some Expected answer:
- i) because we are hungry.
- ii) to help us to work.
- iii) to grow.
- iv) to get energy.

**Activity 1:** (10 mins)
Through teacher led discussion pupils explain the term energy.

**Activity 2:** (20 mins)
Teacher provided materials and task cards to pupils to perform activities in order to discover various sources of energy.

**Activity 3:**
Let pupils draw table showing the sources of energy and the type of energy produced.

**Activity 4:**
With the use of hand lens, carbon paper, evaporation disc and water.

**Closure:**
Summarize lesson, using questions and answers.

**RPs:** Pupils can explain why they eat food.

---

**TEACHING-LEARNING ACTIVITIES (TLAs)**

**TLMs**
- Syringe, water, lens, dry cell, bulbs, copper wire.
- Hand lens, carbon paper, evaporation disc and water.

**CORE POINTS**
- Energy is the ability or capability to do work.
- Solar energy can produce heat with dries or burns substances.

**Evaluation**
- Explain the term ‘energy’.
- List 4 sources of energy.
- Pupils draw table showing sources of energy and type of energy produced.
- Pupils copy correct answers to question.
## AKATSI

**Class:** P4  
**Subject:** Integrated Science

**References:** 1. Wiredu M.B. et al. Primary Integrated Science pupils book pages 126-130  

<table>
<thead>
<tr>
<th>DAY/DATE</th>
<th>TOPIC/SUBTOPIC</th>
<th>RPK/OBJECTIVES</th>
<th>TEACHING-LEARNING ACTIVITIES (TLAs)</th>
<th>TLMs</th>
<th>CORE POINTS</th>
<th>EVALUATION</th>
</tr>
</thead>
</table>
|          | TOPIC: Interaction of matter. | RPK: Pupils pull and push objects. | **INTRODUCTION (5mins):**  
- Ask a pupil to push a door to close it and another pupil to open the same door.  
- Ask another pupil to push his desk and also pull a colleague.  
- Let them describe their observations | | | |
|          | SUBTOPIC: Forces | **OBJECTIVES:** By the end of the lesson pupils will be able to:  
  i) explain the term “Force”.  
  ii) 5.1.2 describe at least two different types of force. | **ACTIVITIES**  
  (1) Lead pupils through discussions to come out with the explanation of “force”.  
  (2) a) Let pupils throw various objects e.g stones, oranges up and observe them fall back to the ground.  
      b) Let them say and discuss their observations.  
  (3) a) Guide pupils to put their two palms together and rub them quickly and observe what happens.  
      b) Let them smear pomade in their palms now and rub them together again and feel it and discuss.  
  (4) a) Guide pupils to bring a magnetic material(e.g. a nail) towards a magnet  
      b) Let pupils say and discuss their observations. | **APPLICATION:**  
A person jumping out from an airplane uses a parachute to reduce the gravitational force. | | |
|          |                  |                | **CLOSURE (2mins):**  
Ask pupils some oral questions based on the topic treated. | | | |
|          |                  |                | **REMARKS** | Explain the term ‘force’.  
An object thrown up always comes down due to a force.  
This force is called **gravitational force**  
It is the force that pulls everything to the earth.  
The friction between the palms makes the movement difficult.  
Oiling the palms reduces the friction.  
**Frictional force** is the force which slows down the movement between two objects in contact.  
**Magnetic force** is the force found in magnets that attracts magnetic materials. | | |
### ADANSI NORTH

**SUBJECT:** integrated Science  
**CLASS:** B.S. 4  
**REFERENCES:**  
2. M.Baah, Man and his environment, page 4-9

<table>
<thead>
<tr>
<th>Day/ Duration</th>
<th>Topic/ Sub-topic</th>
<th>R.P.K. Objectives</th>
<th>T.L.M. Teaching Learning Activities/Closure</th>
<th>Core Points/Application</th>
<th>Evaluation/ Remarks</th>
</tr>
</thead>
</table>
| Wednesday 24/10/07 60 mins | Groups of Animals | Children play and care for animals and also use animals in various ways | Pictures of animals that live in water, in air and on land. Examples are tilapia, mud fish, goat, lizard, vulture, cat, horse, rabbit, tortoise, dog, snail, and frog. **Introduction:**  
1. Pupils give names of some animals they know.  
2. Pupils group animals into two according to those that live in the home and those that live outside the home.  
3. Pupils give two differences between a dog and a fish. | **Expected answers**  
Snake, cat, lizard, dog, cockroach, fowl/hen, duck, tilapia.  
Animals at home include: hen, duck, and cockroach.  
Animals outside home include: snake, tilapia.  
Dog walks but fish swims.  
Dog lives on land but fish lives in water.  
**Activity**  
1. Give pictures of animals to pupils for grouping using their own criteria.  
2. Pupils give reasons to their grouping of the animals.  
3. Guide pupils to regroup if necessary, the animals according to their movement, living places and body coverings.  
**Animals and types of movement**  
<table>
<thead>
<tr>
<th>swim</th>
<th>fly</th>
<th>Walk</th>
</tr>
</thead>
<tbody>
<tr>
<td>tilapia</td>
<td>Cockroach, Cricket, Fowl, Crow, vulture</td>
<td>Goat, fowl, tortoise, dog, cat, vulture, cockroach, lizard</td>
</tr>
<tr>
<td>Animals and their living places</td>
<td>In water</td>
<td>In air</td>
</tr>
<tr>
<td>tilapia</td>
<td>Vulture, Crow,</td>
<td>Cricket, Cockroach, snail, Goat, Fowl, dog</td>
</tr>
<tr>
<td>Animals and their body covering</td>
<td>cuticle</td>
<td>shell</td>
</tr>
<tr>
<td>Cockroach, cricket</td>
<td>Tortoise, snail</td>
<td>Vulture, crow</td>
</tr>
<tr>
<td>Some uses of body coverings in animals</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. For protection of the parts inside the body  
2. To prevent heat from entering and leaving the body  
3. Act as water proof |  
Some uses of animals  
1. Some animals are used as pet (cat)  
2. Some animals are used as food (snail)  
3. Some animals are used for security (dog)  
4. Some animals are used for games (horse for horse racing)  
5. Some animals are used for transportation of humans and goods (horse, camel)  
6. Some animals are used for research (to find out position and shape of certain body parts) |  
Application  
Care for animals due to their importance. | 1. Name 2 animals each that swim, walk, fly or crawl.  
2. Where does each of the following lives? (mud fish, parrot, horse, crow)  
3. Match the animals in table A to their body coverings in table B.  
4. Give 2 uses of animal coverings.  
5. Write down 2 uses of 3 named animals. |

**Summary**  
Children play and care for animals and also use animals in various ways.  
By the end of the lesson, the pupils will be able to:  
1. Group animals according to their movement, living places and body coverings.  
2. Give an importance of body coverings in animals.  
3. Mention 2 uses of named animals  
4 Discuss uses of body covering to animals.  
5 Discuss with pupils the uses of the animals listed, as well as the meaning of some new terms e.g. cuticle  
**Closure**  
Summarize the lesson for the pupils.
Activity (1) Group the animals listed in the table below according to their type of movement.

<table>
<thead>
<tr>
<th>Animals that swim</th>
<th>Animals that fly</th>
<th>Animals that walk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Activity (2) Group the animals according to their living places.

<table>
<thead>
<tr>
<th>Animals in water</th>
<th>Animals in air (on tree)</th>
<th>Animals on land</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Activity (3) Group the animals according to their type of body covering.

<table>
<thead>
<tr>
<th>Cuticle</th>
<th>Shell</th>
<th>Feathers</th>
<th>Scales</th>
<th>Fur</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## ADANSI NORTH

**Class:** BS 4  
**Subject:** Integrated Science

**References:** New Syllabus for BS 4, pg10.  
Course Book BS 6, pg77.

<table>
<thead>
<tr>
<th>Day/ date/ duration</th>
<th>Topic/ subtopic</th>
<th>RPK/ OBJECTIVES</th>
<th>TEACHING – LEARNING ACTIVITIES</th>
<th>TLM</th>
<th>CORE POINTS</th>
<th>EVALUATION</th>
</tr>
</thead>
</table>
|                     | **Topic:** Inductors and capacitors in an electric circuit  
**Subtopic:** Simple electrical circuit in series and the functions of the component. | **RPK:** Pupils have been using torchlight and other electrical appliances.  
**Objectives:** By the end of the lesson pupil will be able to;  
1. Construct a simple circuit in series.  
2. State the functions of at least two parts of components of the circuit. | **INTRODUCTION**  
Use questions and answers to introduce the lesson. e.g. What do you use in the night to see in darkness?  
Answer: lamp, torchlight.  
What are the parts of the torchlight that makes it to produce  
Answer: bulb, wire, dry cell, switch | **Wire bulb** | **Functions of the components of the circuit.**  
- **Key** – it is used to close or open the circuit.  
- **Bulb** – it shows that current is flowing through the circuit  
- **Dry cell** – it is the source current round the circuit  
- **Connecting wire** – it is used to transfer current from the dry cell to the bulb | **APPLICATION**  
There will be no light of the circuit is opened. |
|                     | **ACTIVITIES**  
1. Introduce the components of the circuit to the pupils.  
- Group the pupils and give the TLMs and work cards to them to follow the instructions to make a simple electric circuit in series  
2. Assist pupils to state the functions of the components of the circuit they have constructed. | | | | |
|                     | **CONCLUSION**  
Summarize the functions of the components of the circuit with pupils.  
What happens if the circuit is opened? | | | | |
### Day/Date/Duration

#### Topic/Subtopic
- **Class:** P5
- **Subject:** Integrated Science
- **References:** Integrated Science Syllabus, pg38-39, Pupils textbook, pg48-49, Teacher’s guide, pg 42-43

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Time</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RPK / Objective</th>
<th>RPK</th>
<th>TEACHING-LEARNING MATERIALS (TLM's)</th>
<th>Teaching-Learning Activities (TLA's)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pupils work in the school garden.</td>
<td>Loamy, sandy and clayey soils, funnels filter paper / cotton wool, beakers (plastic) water etc.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INTRODUCTION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through question and answer method, pupils state they types of soil in their locality.</td>
</tr>
<tr>
<td>Expected answer: garden soil, clayey soil, sandy soil, black soil.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACTIVITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. - Put pupils into groups of five and give them the 3 samples of soil.</td>
</tr>
<tr>
<td>- Pupils touch, feel and describe the soils samples provided in terms of color, texture and particles size and record their observations in a table.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of Soil</th>
<th>Color</th>
<th>Size of particles</th>
<th>Feel/Texture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clayey</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loamy</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 2. - Using the same type of soil samples, pupils find out if the types of soil allow water to pass through them at the same time by following instructions on a work card. |
| - Ask the group leaders to read out their observation and discuss their group finding with the class. |

<table>
<thead>
<tr>
<th>Type of Soil</th>
<th>What happened to the water after 3 minutes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandy</td>
<td></td>
</tr>
<tr>
<td>Clayey</td>
<td></td>
</tr>
<tr>
<td>Loamy</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Closure:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- End lesson through question and answer method.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Core Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Different soils allow water to drain through them at different rates. Sandy soil allows water to pass through easily. Loamy soil allows water to pass through it better than clayey soil.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loamy soil holds sufficient water for pleasant growth.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral questions what type of soil is in the school garden?</td>
</tr>
<tr>
<td>Written questions which soil type will dry up quickly and why?</td>
</tr>
<tr>
<td>Which soil will be best for growing crops in the garden?</td>
</tr>
</tbody>
</table>
ASEI/PDSI WORKSHOP AJUMAKO 14TH -19TH OCTOBER, 2007

WATER HOLDING CAPACITY OF SOILS (P5)

ACTIVITY 2

MATERIALS NEEDED:

COTTON WOOL, PLASTIC CONTAINERS, SAMPLES OF SOILS, FUNNELS

THINGS TO DO

1. Put equal amount of tissue/cotton/toilet roll in the neck of the 3 funnels provided for your group.
2. Measure equal volumes of the 3 soil samples provided.
3. Pour the measured soil into the 3 different funnels.
4. Tap/shake the funnels to allow the soil to settle.
5. Place the funnels with the soil on the plastic mineral water containers provided.
6. Measure equal volumes of water using the containers provided.
7. Pour the measured volume of water into the funnels containing the soil samples.
8. Allow the set up to stand for about 10 minutes.
9. Observe and record what happens after 10 minutes in the table provided below.

<table>
<thead>
<tr>
<th>TYPE OF SOIL</th>
<th>SANDY SOIL</th>
<th>LOAMY SOIL</th>
<th>CLAYEY SOIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIME TAKEN FOR WATER TO PASS THROUGH SAMPLE SOIL</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Result of the Experiment

<table>
<thead>
<tr>
<th>Type of Soil</th>
<th>What happened to the water after 3 minutes?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clay</td>
<td></td>
</tr>
<tr>
<td>Sand</td>
<td></td>
</tr>
<tr>
<td>Loam</td>
<td></td>
</tr>
</tbody>
</table>

## Properties of Soil Types

<table>
<thead>
<tr>
<th>Type of Soil</th>
<th>Colour</th>
<th>Size of Particles</th>
<th>Feel or Texture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clayey</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loamy</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Integrated Science

**Subject:** Integrated Science  
**Class:** P5  
**Day/Date/Duration:** Thursday, 25/10/07, 60 minutes  
**Reference:** 1. Primary School Science Syllabus, pg.38-39  
2. Integrated Science Bk.5, pg. 103-107

<table>
<thead>
<tr>
<th>Day/Date/Duration</th>
<th>Topic/Subtopic</th>
<th>RPK/Objectives</th>
<th>TLMS/Teacher Learner Activities</th>
<th>Core Points</th>
<th>Evaluation/Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, 25/10/07</td>
<td>Soil-Types and properties of soil</td>
<td>Pupils have been playing with soil.</td>
<td>Samples of the three main types of soils, funnels, Voltic water bottles, water, stick, cotton wool.</td>
<td>Soil refers to the top layer of the ground in which plants can grow. Soil can be grouped into sandy, clayey and loamy (garden soil).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>INTRODUCTION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Through questions, revise pupils’ RPK to bring out the topic. E.g. What do you use to mould/make cars, animals, human beings etc. when you are playing? Ans: Soil.</td>
<td>The different types of soils have different textures. It is only the clayey soil which keeps its shape and can be picked up. Loamy soil can also keep its shape but cannot be picked up. Sandy soil cannot keep its shape and cannot be picked up.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>OBJECTIVES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>By the end of the lesson, the pupil will be able to: (i) name the three (3) main types of soil (ii) determine differences in the texture of sandy, clayey and loamy soils (iii) demonstrate water holding capacity of sandy soil, clayey soil and loamy soil.</td>
<td>The different samples of soil allow water to pass through them differently. Sandy soil allows water to pass through it easily. Loamy soil does not allow water to pass through it easily. Clayey soil holds the most water and it is difficult for water to pass through it.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>ACTIVITIES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. Lead pupils to explain the term ‘Soil’ and discuss the types of soil with them.</td>
<td>Pupils can now tell the type of soil that is good for farming purposes.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. (a) In groups, let children feel each sample of soil between their fingers in the dry form and record their observations. (b) Let pupils repeat the activity in (a) above but with the soil samples wet. Ask them to try and roll each soil sample into a ball and try to pick each up. Let them record their observations. (c). Discuss with pupils the types of soils they worked with.</td>
<td>Which types of soil (sandy, clayey or loamy) do you think is good for farming? Explain why.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Fill the three transparent containers to the same level with each of the three types of soil. Pour the same volume of water on each soil sample in the containers at the same time. Observe which type of soil allows the water to pass through easily.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Discuss with pupils the type of soil which holds water best and therefore best for farming</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>CONCLUSION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Summarize the main ideas on the chalkboard to end the lesson. Ask pupils to tidy up.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ACTIVITY SHEET - SOILS

ACTIVITY ONE
How does it feel?

INSTRUCTIONS

1. Pour little portion of the three types of soil on the sheet given to you. Rub each sample between your fingers.

2. How does each sample of soil feel?

3. Write Yes or No for your observations in the table below:

<table>
<thead>
<tr>
<th>Type of soil</th>
<th>Smooth</th>
<th>Rough</th>
<th>Not smooth/ Not rough</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clayey</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sandy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loamy</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ACTIVITY TWO
Which soil sample holds water longer?

INSTRUCTIONS

1. Fill each of the three funnels with one type of soil sample.

2. Pour the water given on the samples of soils in the funnel at the same time.

3. Watch which soil allows all the water to pass through it faster.

4. Write your results in the table below:

<table>
<thead>
<tr>
<th>How water flows out of soil</th>
<th>Type of soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Water flows out very fast</td>
<td></td>
</tr>
<tr>
<td>2. Water flows out fast</td>
<td></td>
</tr>
<tr>
<td>3. Water flows out very slowly.</td>
<td></td>
</tr>
<tr>
<td>DAY/DATE/DURATION</td>
<td>TOPIC/SUB-TOPIC</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Tuesday 23-10-2007</td>
<td>Heat energy</td>
</tr>
</tbody>
</table>

**TOPIC:** Heat energy  

**SUB-TOPIC:** Conduction  

**RPK:** Pupils can tell the effect of charcoal fire in a box iron  

**OBJECTIVES:**  
1. By the end of the lesson, the pupil will be able to:  
   a. Describe one method by which heat energy travels.  
   b. Perform an experiment on how heat travels in a solid.  

2. Introduction:  
   Find out from pupils how a box iron gets heated when they want to iron. Let pupils predict what will happen if a metal spoon is put into a cup of hot tea.  

3. Activities:  
   1. Let pupils test their prediction by pouring hot water in a tea cup and putting a metallic spoon in it and observe what happens and write their observations.  
   2. Let pupils place shea butter at intervals on the iron bar.  
   3. Let pupils support the iron bar on a stand as shown in the diagram.
(iv) Let pupils use a lighted candle to heat one end of the metal.

2) (i) Let pupils describe the way the shea butter melted and suggest why.

(ii) Let pupils suggest a name for the process by which the heat traveled in the demonstration

**CLOSURE**
Discuss with pupils the activity they have performed and summarize the salient points of the lesson.

<table>
<thead>
<tr>
<th>KEY</th>
<th>A-support</th>
<th>B-copper wire</th>
<th>C-shea butter</th>
<th>D-burning candle</th>
<th>E-wooden stand</th>
</tr>
</thead>
</table>

The shea butter closer to the candle melted first.

Conduction is the process of heat transfer from one point to another through a material which is solid.

**APPLICATION**
Handles of household utensils are made of wood or plastic

2. Which shea butter melted first? Why?

3. How was the heat transferred?

4. What is the name given to this method of heat transfer?

Why are metallic ladles not used in cooking banku?

**REMARKS**
### MIXTURES: preparation and separation of some mixtures.

**RPK**
- Pupils know some substances are soluble while others are insoluble in water.
- They prepare some meals by mixing varied food substances

**Objectives:**
- By the end of the lesson a pupil will be able to:
  1. a) explain the concept mixture.
  2. b) demonstrate the formation of solid-solid mixture, liquid-liquid mixture and also separate these mixtures.

**TEACHER – LEARNER ACTIVITY**

<table>
<thead>
<tr>
<th>Activity</th>
<th>TLMs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.</strong> Pupils identify the physical states of the TLMs given. They form a solid-solid mixture from iron filings and chalk powder. They separate the mixture using a magnet.</td>
<td>Chalk powder, iron filings, 12 magnets, 1 litre of edible oil, 12 cut-out frytol bottle bottoms, 12 cut-out frytol bottle tops, 12 nails, 12 camphor balls, perfume,</td>
</tr>
<tr>
<td><strong>2.</strong> Pupils identify the physical states of the TLM. They form a liquid-liquid mixture from water and oil. They separate the water from the oil.</td>
<td></td>
</tr>
<tr>
<td><strong>3.</strong> Discuss with pupils more examples of solid-solid and liquid-liquid mixtures in their homes.</td>
<td></td>
</tr>
</tbody>
</table>

**INTRODUCTION**
- a) Pupils are asked to state the three states of matter.
- b) Some salt and a stone are placed in water which one will dissolve easily and why?
- c) State three different food items used for preparing fufu/soup/salad.
- d) Which materials are used to make mortar?

**Discussion**
- Discuss the concept ‘mixture’ with pupils

**Activity 1**
- a) Solid, liquid and gas.
- b) The salt will dissolve easily because its particles are more loose than that of the stone.
- c) Fufu: plantain, cocoyam, cassava, yam. Soup: meat, Salt, water, fruit/root/leafy vegetables, oil, etc.
- d) Concrete: water, cement, stones, sand.

**Mixture**
- Mixtures are substances produced from the physical combination of two or more different substance.
- The components of mixtures can be separated using a physical method or processes. No new chemical substance is formed in mixtures.

**Type of mixture**
- Solid-solid mixture
- Substance formed: iron filings + chalk powder
- Method of separation: magnetisation

**Liquid-liquid mixture**
- Substance formed: oil + water
- Method of separation: decantation

---

**Evaluation**

1. What is a mixture?
2. List two examples each of solid-solid and liquid-liquid mixtures.
STUDENTS WORKSHEET

NAME OF SCHOOL:……………………………………… CLASS: Primary six

TOPIC: MIXTURES DATE: …..October 2007 TIME…………

SUBTOPIC: PREPARATION AND SEPARATION OF SOME MIXTURES.

NAMES:…………………………
…………………………
…………………………

T/L MATERIALS:
iron filings, chalk powder, water, palm oil, stones, rice grains, magnet, perfume / camphor, powdered salt, two improvised beakers and trays.

NB: Identify to insure that the items written in the worksheet is what your group has been given

QUESTION
1. Predict:
   Will the appearance or nature of two of your solids change if they are put/ combined together in a container?

2. Predict :
   Will the appearance or nature of two of your liquids change if they are combined together in a container?

ACTIVITY 1

Materials: Use the iron filing, the chalk and magnet.

Question: what state of matter is the iron filings and the chalk powder?

Iron filings are…………………………and chalk powder is……………………

Procedure
(i) put the iron filings in the container,
(ii) add the chalk powder to the iron filings in the container
(iii) Stir the things in the container to form a uniform combination.
(iv) What name is given to the uniform substance produced?
   ........................................................................................................
(v) Can you separate the iron filings from the chalk powder?......................
(vi) Put the magnet into the mixture and stir thoroughly.
(vii) (a) Remove the magnet. What substance is on the magnet?..................
    (b) What substance is left back inside the container?............................
ACTIVITY 2

Materials: use the water, the frytol oil, the cut-out frytol container top (A), The cut-out frytol container bottom (B) as a beaker and the nail.

Question:
1. What is the state of matter of the frytol oil and the water?
2. The oil is a ...................... and the water is a ....................
3. Will the oil and the water combine to form one complete uniform substance? Yes/ No

Procedure
(i) Put the container A into the container B
(ii) Pour the oil into the container A
(iii) Add some of the water into the oil in the container A
(iv) Stir the combination and allow it to settle as shown in the diagram
(v) Has the two substances combined completely to form a uniform substance? Yes/ no
Which substance settles at the top?...........................................
Which substance settles at the bottom?.....................................
Label the substance in the diagram as they have settled in your bottle.

Diagram of the activity

(frytol bottle top)
container A
(Lid of bottle)
container B
(frytol bottle bottom)

(vi) Can you separate the oil from the water? YES / NO.
(vii) Piece the nail through the lid of the container A and allow only the bottom liquid to drain down into container B.
The liquid left in the container A is called ..............................

Thanks for your effort. Keep up.

By: Georgina and Eric Ajongba
Kassena –Nankana District.
<table>
<thead>
<tr>
<th>DAY/DATE/DURATION</th>
<th>TOPIC/SUB-TOPIC</th>
<th>OBJECTIVES/R.P.K.</th>
<th>TEACHER/LEARNER ACTIVITIES</th>
<th>TEACHING/LEARNING MATERIALS</th>
<th>CORE POINTS</th>
<th>EVALUATION/EXERCISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAY: Thursday</td>
<td>Topic</td>
<td>Diversity of matter</td>
<td>R.P.K. Pupils do observe burning fires.</td>
<td>Matches, Candles, beakers/transparent materials</td>
<td>The candle which is covered goes off while the candle left uncovered continues to burn. Air is necessary for burning/combustion.</td>
<td>State any four uses of air.</td>
</tr>
<tr>
<td>DATE: 18th Oct, 2007</td>
<td>Sub-Topic</td>
<td>Air supports burning</td>
<td>Objectives: By the end of the lesson, the pupils will be able to: 1. Demonstrate that air supports burning. 2. State other two uses of Air</td>
<td>Matches, Candles, beakers/transparent materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DURATION: 60 minutes.</td>
<td></td>
<td></td>
<td>Introduction (5 minutes): 1. Children to predict what happens when 2 charcoal pots of fire used for cooking; one is fanned while the second one is not fanned. 2. Pupils to identify TLMs on demonstration table with the help of the teacher. Eg. Candle, match box etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td></td>
<td>Activities(40 minutes): 1. Put pupils into groups and distribute TLMs through group leaders. 2. Using the worksheet, assist pupils to perform the experiment to show the behaviour of fire with air 3. Pupils report their findings to generate class discussions and draw conclusions. 4. Ask pupils to mention some other uses of Air in their daily life.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
<td></td>
<td>Conclusion (15 minutes) Through questioning and discussions, lead pupils to state at least 4 uses of air.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Set class exercises to assess pupils understanding of the lesson. Move run to assist pupils with difficulties.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**APPLICATION**

1. A room on fire when deprived of air, will stop burning 2. When a blanket is spread over fire, no air will be allowed in, thus, the fire will go off 3. A person whose clothes catch fire should roll on the ground. And not run about.

**CLASS EXERCISE**

Draw and label a diagram to show that air supports burning. What would you do if the clothes you were wearing caught fire accidentally?
ACTIVITY: What happens when a burning candle is covered?

THINGS NEEDED: 3 candles of equal height, 3 transparent containers, matches

WHAT TO DO:
1. Place three short candles of equal height firmly on top of your desk and label them as A, B, C
2. Light the candles and allow them to burn for some time.
3. Cover two of the burning candles with the transparent containers at the same time. Leave one uncovered
4. Observe what happens and record your findings.

QUESTIONS:
1. Which candle burns for a longer time and why?
2. What happens to the candle covered with the shorter container and why?
3. Write down your conclusion.
4. Label the diagrams.
<table>
<thead>
<tr>
<th>Day/ date/ duration</th>
<th>Topic/ subtopic</th>
<th>RPK / OBJECTIVES</th>
<th>TEACHING-LEARNING ACTIVITIES (TLAs)</th>
<th>TLMs</th>
<th>CORE POINTS</th>
<th>EVALUATION &amp; REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration:</strong> 60 mins</td>
<td><strong>Topic:</strong> Seeds</td>
<td><strong>Subtopic:</strong> Parts of seed</td>
<td><strong>RPK:</strong> Pupils can define a flower and can name some fruits with seeds.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Objectives:</strong> By the end of the lesson pupils will be able to:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. Identify parts of a seed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Distinguish a monocotyledonous seed from a Dicotyledonous seed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Let pupils try to remove the outer cover of the seeds, and also separate the seeds into two halves to identify other parts inside the seed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Again in groups lead pupils to remove the outer cover of maize soaked overnight. Pupils to cut through the maize longitudinally to identify the parts inside the maize seed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Guide pupils to identify the actual names given to these parts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6. Paste a chart of a well drawn diagram of maize and a cowpea seed on the chalkboard. Display cutouts of names of the parts of the seed on a table. Let pupils pick the cutout from the table and fix it on the corresponding part on the chart to give the right labelling.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7. Through leading question guide pupils to distinguish monocotyledonous seed from a dicotyledonous seed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>INTRODUCTION</strong> Let pupils mention fruits that contain seeds.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>ACTIVITIES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. In groups let pupils observe arrangement of seeds in some main fruits in longitudinal section. Pupils pick a seed to identify where the seed was attached to the fruit wall.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Give cowpea seeds soaked overnight to the various groups with Leaders to press gently and identify where water comes out of the seed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Let pupils try to remove the outer cover of the seeds, and also separate the seeds into two halves to identify other parts inside the seed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Again in groups lead pupils to remove the outer cover of maize soaked overnight. Pupils to cut through the maize longitudinally to identify the parts inside the maize seed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Guide pupils to identify the actual names given to these parts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6. Paste a chart of a well drawn diagram of maize and a cowpea seed on the chalkboard. Display cutouts of names of the parts of the seed on a table. Let pupils pick the cutout from the table and fix it on the corresponding part on the chart to give the right labelling.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7. Through leading question guide pupils to distinguish monocotyledonous seed from a dicotyledonous seed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>CONCLUSION</strong> Summarize lesson through Question and Answer</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Fruits with seeds are:** Orange, Pawpaw, Tomatoes etc

Where seeds was attached to fruit wall is called **hilium**

The tiny hole through which water drips out of the seed is called **micropyle**.

Actual names of parts of a seed are:
- **Hilium (Scar)** where seed was attached to the fruit wall.
- **Micropyle (Tiny hole in the seed).**
- **Plumule (young shoot).**
- **Radicle (young root).**
- **Embryo (young plant).**
- **Cotyledon (seed leaf).**
- **Endosperm (food store).**
- **Testa (Outer cover).**

Seeds with two cotyledons are called dicotyledonous seeds eg. Cowpea, Mango, Okra, Groundnut etc.

Seeds with one cotyledon are called monocotyledonous seeds eg. Maize, Onion, Coconut, Rice etc.

- **Answer the following questions**
- **Which part of the seed is attached to the fruit wall?**
- **Mention the parts of a seed.**
- **Fix a card with names of parts of seeds written on them to correspond to the parts of the diagram.**
- **Group the various seeds under monocot and dicot.**
- **Identify the parts of a Maize grain.**
<table>
<thead>
<tr>
<th>DAY/ DATE/ DURATION</th>
<th>TOPIC/ SUB-TOPIC</th>
<th>OBJECTIVES/ R.P.K.</th>
<th>TEACHER/LEARNER ACTIVITIES</th>
<th>CORE POINTS</th>
<th>EVALUATION/ EXERCISES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday &amp; Friday</td>
<td>Topic: Heat</td>
<td>Objectives:</td>
<td>candle wax, matches, water, coal pot, charcoal, metallic tins or rods, paper, box iron, ladles with plastic handles etc.</td>
<td>Heat energy is transferred from the point of higher temperature to a point of lower temperature. When it is transferred through solids as the medium e.g. metals, it is called conduction.</td>
<td>Answer the following questions</td>
</tr>
<tr>
<td>25th &amp; 26th October, 2007</td>
<td>Sub-topic: Transfer of heat</td>
<td>By the end of the lesson, each pupil will be able to 4.2.7 explain the three main types of heat transfer – conduction, convection and radiation.</td>
<td>INTRODUCTION: 1. Introduce the lesson by asking the pupils to tell how heat is used in cooking their food. Example: How do we have our foods cooked? Expected answers: (i) we boil, roast, fry, cook, etc. When we boil, roast, fry or cook, which sources of heat do we often use? Expected answers: gas, charcoal, firewood, etc.</td>
<td>1. Explain conduction.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>R.P.K.: Pupils can talk about how heat energy is used in cooking food.</td>
<td>PRESENTATION: ACTIVITY I: Give out the materials and the worksheets to pupils and let them carry out the instructions below: 1. Put some pieces of shea butter or wax on top of the empty tin 2. Put the tin on fire for some few minutes 3. Observe what happens carefully and write your observations down. 4. Write your observations. 5. Hold one end of the knife and put the other end into the fire for sometime 6. Write your observation</td>
<td>Heat energy is transferred from the point of higher temperature to a point of lower temperature through the liquid as its medium. This is called Convection.</td>
<td>2. What do you understand by Convection?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ACTIVITY II: 1. Pour cold water into the empty tin 2. Feel the temperature (how cold or hot it is) 3. Put the tin on the fire to heat the content. 4. Insert a straw to the bottom of the tin and pour a small amount of food colour into it. 5. Record the direction of the movement of the food colour</td>
<td></td>
<td>3. What do you understand by radiation?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Home work Write two (2) activities each that show conduction, convection and radiation.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ACTIVITY III:
1. Put the coal pot and the fire at the centre of the table
2. Feel the heat by drawing your hands closer to the fire very carefully
3. Write your observations
4. Wet a piece of paper
5. With the aid of a stick, stretch it over the fire for some minutes
6. Observe what happens and write your observations

ACTIVITY IV:
Discuss with pupils their observations and findings.

CONCLUSION:
Use oral questions to evaluate pupils understanding of the lesson.

Heat energy is transferred from a point of higher temperature to a point of lower temperature without any visible medium. It may be air or vacuum. This is called **Radiation**.

**APPLICATION OF CONDUCTION**
1. Use of plastic spoons
2. Cooking pans with wooden or plastic handles
3. Wooden handle of a box iron

**APPLICATION OF RADIATION**
1. Roasting of plantain and corn
2. Baking of bread, meat pie, cakes, etc.
3. Drying of washed clothes and ironing.

**APPLICATION OF CONVECTION**
1. Boiling of egg and other foods
2. Preparation/cooking of soups and porridges
3. Frying of flour products, etc.

Heat can be transferred through three main stages. These are: **Conduction, Convection and Radiation**.
WORKSHEET

**ACTIVITY I:**
1. Put some pieces of shea butter or wax on top of the empty tin
2. Put the tin on fire for few minutes
3. Observe what happens carefully
4. Write your observations.
5. Hold one end of the knife and put the other end into the fire for sometime
6. Write your observation

**ACTIVITY II:**
1. Pour cold water into the empty tin
2. Feel the temperature (how cold or hot it is)
3. Put the tin with water on the fire and allow it to warm
4. Dip your finger into the water carefully.
5. Write your observations

**ACTIVITY III:**
1. Put the coal pot and the fire at the centre of the table
2. Feel the heat by drawing your hands closer to the fire very carefully
3. Write your observations
4. Wet a piece of paper
5. With the aid of a stick, stretch it over the fire for some minutes
6. Observe what happens and write your observations.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday</td>
<td>Collecting and handling data</td>
<td>Pupils can mention some example of diseases in their area.</td>
<td>Introduction</td>
<td>Ask pupils to mention some of the diseases they have head of and list them on the board. ie. Malaria, headache, HIV/AIDS, diarrhea etc.</td>
<td>Expected answers: Malaria, Headache, HIV/AIDS, diarrhea etc.</td>
<td></td>
</tr>
<tr>
<td><strong>Date</strong></td>
<td><strong>Sub-topic</strong></td>
<td><strong>Collecting data</strong></td>
<td><strong>Activities</strong></td>
<td><strong>1. Put pupils into groups and name the groups as Brong Ahafo [BA], Greater Accra [GA], Central Region [CR], Western Region [WR].</strong></td>
<td>Match boxes</td>
<td></td>
</tr>
<tr>
<td>18/10/07</td>
<td></td>
<td></td>
<td></td>
<td>2. Distribute the match boxes to pupils in groups according to a study on people who have been infected with malaria in some different Regions of the country.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration (60 min.)</td>
<td></td>
<td></td>
<td></td>
<td>3. Ask pupils in groups to place their match boxes [on top of each other] on the table according to the malaria patients in different religions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Collecting data with match boxes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>BA</td>
<td>GA</td>
<td>CR</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

1. Which region recorded the highest number of people?

2. Which region or regions recorded the lowest number of people?

3. How many people have been infected in the four regions?
4. Call a pupil to count the number of boxes in each region and record the values on the tables like this:

PEOPLE INFECTED WITH MALARIA

<table>
<thead>
<tr>
<th>Regions</th>
<th>Peoples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Brong Ahafo (BA)</td>
<td>4</td>
</tr>
<tr>
<td>2. Greater Accra (GA)</td>
<td>8</td>
</tr>
<tr>
<td>3. Central region (CR)</td>
<td>6</td>
</tr>
<tr>
<td>4. Western region (WR)</td>
<td>3</td>
</tr>
</tbody>
</table>

5. Guide the pupils to represent the data on a simple bar graph.

**Conclusion**

1. Ask pupils questions on the bar graph to test their understanding of the lesson.
2. Encourage pupils to ensure accuracy in recording data.

A chart showing the number of people who have been infected with malaria in four regions in Ghana.
### Day: Wednesday  
**Date:** 17/10/07  
**Duration:** 60 mins

<table>
<thead>
<tr>
<th>Day/ date / duration</th>
<th>Topic/ subtopic</th>
<th>RPK/ OBJECTIVES</th>
<th>TEACHING-LEARNING MATERIALS (TLMs)</th>
<th>TEACHING-LEARNING ACTIVITIES (TLAs)</th>
<th>CORE POINTS</th>
<th>EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Topic: Fraction</td>
<td>Objective: By the end of the lesson pupils will be able to;</td>
<td>TLMs: Strips of paper, fraction charts, cuisenaire rods, countable objects</td>
<td>RPK: Pupils can use practical activities like paper folding to show fractions like 1/2 and 1/4.</td>
<td>1. Color to show one eighth and write the fraction in the box.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Subtopic: One-eighth</td>
<td>i) Identify one out of eight equal parts as one-eighth.</td>
<td>INTRODUCTION: Assist pupils to use practical activities like paper folding to revise the fraction 1/2 and 1/4.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ii) Identify and write the symbol for one-eighth (1/8).</td>
<td>ACTIVITY 1: Guide pupils to use paper folding fraction charts to identify one out of eight equal parts as one-eighth.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>iii) Identify and write symbols for multiples of half fourth and eighth.</td>
<td>ACTIVITY 2: Assist pupils to group countable objects into eight equal parts and identify one part as one-eighth.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
|                      |                | i.e. | ACTIVITY 3: Guide pupils to divide two or more wholes (up to five) to find the number of one eighths in two or more wholes.  
16 eighths are obtained in two wholes. |  |  |
|                      |                | 1/8 1/8 1/8 1/8 1/8 1/8 1/8 1/8 | ACTIVITY 4: Guide pupils to use materials to illustrate one-eighth, write the symbol 1/8 one-eighth. |  |  |
|                      |                | | The 8 in 1/8 represents the number of divisions (denominator) of the whole and the 1 (numerator) represents the number of parts under consideration. |  |  |

2. Find the number of eighth in 3 wholes.

3. Write the symbol for one part out of eight equal parts of a whole.
# Lesson Plan

**Assin North**

**Lesson Plans - ASEI & PDSI Workshop**

**WEEK-ENDING:** 25th October 2007  
**SUBJECT:** Mathematics  
**CLASS:** B.S. 3  
**NO ON ROLL:** 60  
**AVERAGE AGE:** 9 years  
**REFERENCES:**  
1. MOE (2007), MATHS SYLLABUS PP 51  
2. MATHS FOR PRY SCHOOLS, PUPILS BK 3 PP69  
3. TEACHERS' GUIDE BK 3 PP 65

<table>
<thead>
<tr>
<th>Day/Duration</th>
<th>Topic/Sub-topic</th>
<th>R.P.K. Objectives</th>
<th>Teaching/Learning Activities</th>
<th>T.L.M.</th>
<th>Core Points</th>
<th>Evaluation/Remarks</th>
</tr>
</thead>
</table>
| Friday 25/10/07 60 mins | Topic Multiplication of numbers  
Sub-topic The Regrouping Property of Multiplication (Commutative and Associative property) | R.P.K. Pupils do count objects and they have learned about the commutative (order) property of multiplication | Introduction (5 mins)  
Put pupils in groups.  
Display a card showing an array of objects and the sentence e.g. $3 \times 4 = 12$.  
Give a brief explanation to review pupil's RPK. Then display other cards with only arrays of objects for pupils to find factors and products thereof | Countable objects e.g. bottle tops, cardboard | 3 groups of 4 $3 \times 4 = 12$ | Look at the displayed cards and suggest the factors and their products. |
| | | Objectives | | | |
| | | By the end of the stipulated time, the pupils will be able to:  
1. Recall the commutative property (order) of multiplication involving two factors  
2. Show that the product of three numbers does not change if the factors in the multiplication sentence is regrouped | | | |
| | | Presentation/Development (45 mins)  
Step 1 (10 mins)  
1. Using countable objects, make arrays to help pupils revise the commutative (order) property of multiplication involving two factors.  
e.g. $3 \times 5 = 5 \times 3$.  
Let pupils in small groups use different factors to demonstrate this property.  
3 groups of 5 objects  
5 groups of 3 objects | | | |
| | | 2. Guide pupils to perform practical activities using bottle tops to show that the product of three numbers does not change when the factors are regrouped i.e. involving 1-digit factors only.  
i. a) Write $4 \times (3 \times 2) = (4 \times 3) \times 2$ on the CB.  
Beginning with the factors in the brackets, use bottle tops to make an array of 3 groups of 2 objects giving altogether 6 objects on the LHS. Pupils in groups should do the same. | | | |
| | | Step 2 | | | |
| | | The Commutative property of multiplication  
Eg. $3 \times 5 = 5 \times 3$  
3 groups of 5 objects  
$3 \times 5 = 15$ for L.H.S.  
$5 \times 3 = 15$ for R.H.S.  
Product of L.H.S and R.H.S are the same. | | | |
| | | The Regrouping property  
$4 \times (3 \times 2) = (4 \times 3) \times 2$ | | | |
| | | Perform the stated activities in groups using the bottle tops | | | |
3 groups of 2 objects

\[
\begin{array}{c}
\text{\textbullet} & \text{\textbullet} \\
\text{\textbullet} & \text{\textbullet} \\
\end{array}
\]

=6

4 groups of 6 objects

\[
\begin{array}{ccc|ccc}
\text{\textbullet} & \text{\textbullet} & \text{\textbullet} & \text{\textbullet} & \text{\textbullet} & \text{\textbullet} \\
\text{\textbullet} & \text{\textbullet} & \text{\textbullet} & \text{\textbullet} & \text{\textbullet} & \text{\textbullet} \\
\end{array}
\]

=24 for L.H.S.

4 Groups of 3 objects =12 i.e. \((4\times3)\)

\[
\begin{array}{ccc|ccc}
\text{\textbullet} & \text{\textbullet} & \text{\textbullet} & \text{\textbullet} & \text{\textbullet} & \text{\textbullet} \\
\text{\textbullet} & \text{\textbullet} & \text{\textbullet} & \text{\textbullet} & \text{\textbullet} & \text{\textbullet} \\
\end{array}
\]

=12

2 groups of 12 objects =24 for RHS

\[
\begin{array}{c|c}
\text{\textbullet} & \text{\textbullet} \\
\text{\textbullet} & \text{\textbullet} \\
\end{array}
\]

2×12=24

(b). Make an array of 4 groups of 6 objects \((4\times6)\). Count the result to get 24.

(c) Do the same thing for the RHS and compare the results on both sides

ii. Regroup the factors used e.g. \(2\times(3\times4)=(2\times3)\times4\) for pupils in groups to follow the same procedure in i.a and b above to find the result(s) on the LHS and RHS

a) Let pupils make an array of \(3\times4\) objects to get 12 objects and also make an array of 2 groups of 12 objects and count the result. Let pupils follow the same procedure for factors on the RHS.

b) Let pupils compare both results.

Factors regrouped i.e. \(2\times(3\times4)=(2\times3)\times4\)

L.H.S.: 2 groups of 12

\[
\begin{array}{c|c}
\text{\textbullet} & \text{\textbullet} \\
\text{\textbullet} & \text{\textbullet} \\
\end{array}
\]

=24

Factors regrouped i.e.

\(2\times(3\times4)=(2\times3)\times4\)

L.H.S.: 2 groups of 12

\[
\begin{array}{c|c}
\text{\textbullet} & \text{\textbullet} \\
\text{\textbullet} & \text{\textbullet} \\
\end{array}
\]

=24

L.H.S. =24 R.H.S. =24

\(4\times(3\times2)\) L.H.S

\(4\times12=24\)

\((4\times3)\times2\) R.H.S

\(12\times2=24\)

L.H.S. =24 R.H.S. =24
$$=> 2\times(3 \times 4)=24$$

$$=> (2\times3) \times 4=24$$

**STEP 3**

3. Let all group work stop. Present the procedure and arrays on the CB. Ask pupils to make their observations about the result of the product(s) when the products are regrouped. Draw conclusion and assign an exercise e.g. $2\times(3\times5)=(2\times3)\times5$ to test pupil's comprehension.

**SUMMARY (5 mins)**

End the lesson by summarising the properties of multiplication of whole numbers. (Commutative Property and Associative property)

Use bottle tops to find out if regrouping the sentence $(2\times3)\times5=2\times(3\times5)$ will change the product or not. 2) Answer questions 1-5 page 69.
### ASSIN NORTH
LESSON PLANS - ASEI & PDSI WORKSHOP

**SUBJECT:** Mathematics  
**CLASS:** B.S. 3

**REFERENCES:**  
1. REFERENCES: MOE (2007), PRY MATHEMATICS SYLLABUS PP 52  
2. MAG MATHS FOR PRY SCHS PUPILS BK 3 PP 101  
3. TEACHERS' GUIDE 3 PP 50

<table>
<thead>
<tr>
<th>Day/Duration</th>
<th>Topic/ Sub-topic</th>
<th>R.P.K. Objectives</th>
<th>Teaching/Learning Activities</th>
<th>T.L.M.</th>
<th>Core Points</th>
<th>Evaluation/Remarks</th>
</tr>
</thead>
</table>
| 60 mins      | Measurement of Time and Money | By the end of the lesson pupil will be able to:  
3.10.2 Measure the time of an event in minutes | Introduction (5 mins)  
Let pupils work out the number of hours it took Kofi to walk from then school to the next village if he started at 2 O'clock and got there at 4 O'clock.  
Guide pupils to recite the multiplication table involving 5 | Analogue clock face, model clocks, Digital clocks | Time is sometimes measured in hours |
|              | Measuring Time in Minutes | R.P.K.  
1. Pupils can tell the time in hours, half an hour and quarter of an hour  
2. Pupils can recite the multiplication table involving 5 | PRESENTATION/DEVELOPMENT (45 mins)  
**Activity 1**  
Teacher uses an analogue clock face to show how the minutes hand moves through 60 minutes from 12th position through 1, 2, 3…back to the 12th.  
**Activity 2**  
Guide pupils to use the the analogue clock face to show 30 minutes by moving the minutes hand from the 12th position to the 6th position, from the 1st to 7th positions and so on. Introduce the term half past.  
**Activity 3**  
Assist pupils to use the analogue clock face to show 45 minutes from the 12th position to the 9th position, etc. and introduce the term quarter to€46  
**Activity 4**  
Guide pupils to move the minute hand of the clock to other positions and tell the time in minutes eg. From the 12th position to the 4th etc as a form of evaluation. |  |  |
|              |                  |                  |                              |        | 1) How many minutes makes 1 hour? |
|              |                  |                  |                              |        | 2) Half an hour is……… Minutes? |

**CONCLUSION**  
Tr ends lesson by reviewing and summarising through evaluative questions eg. Let pupils use the analogue clock to tell the time in minutes. Ama uses ….. to distribute exercise books to her colleagues.
<table>
<thead>
<tr>
<th>Day/ date/ duration</th>
<th>Topic/ subtopic</th>
<th>RPK/ OBJECTIVE S</th>
<th>TEACHING-LEARNING MATERIALS (TLMs)</th>
<th>TEACHING-LEARNING ACTIVITIES (TLAs)</th>
<th>CORE POINTS</th>
<th>EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 mins</td>
<td>Fraction II: Adding fraction with different denominators.</td>
<td>Objectives: By the end of the lesson, the pupils will be able to add at least two fractions with different denominators.</td>
<td>Rectangular cut outs.</td>
<td>INTERACTION: Give a few like fractions to pupils to add. Eg. $\frac{1}{5} + \frac{3}{5}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>RPK: Pupils can add like fractions.</td>
<td>ACTIVITY 1: Guide pupils to take three rectangular sheets of paper of the same size. Pupils fold the first paper horizontally into two equal parts horizontally and shade one part.</td>
<td>$\frac{1}{2}$ is equivalent to $\frac{3}{6}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2} = \frac{3}{6}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>They fold the second paper vertically into three equal parts and shade one part. i.e.</td>
<td>$\frac{1}{3} = \frac{2}{6}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$\frac{1}{3}$</td>
<td>$\frac{1}{3} = \frac{2}{6}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ACTIVITY 2: Pupils fold the first paper vertically into 3 equal parts and shade one part.</td>
<td>$\frac{1}{3}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$\frac{3}{6}$</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ACTIVITY 3:
Pupils cut the shaded portion of the first and second sheet and paste them on the third sheet and compare region covered by the shaded portions.

\[
\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}
\]

Let pupils use the same method to solve \(\frac{2}{3} + \frac{1}{4}\) and \(\frac{1}{2} + \frac{1}{3}\).

\[
\frac{2}{3} + \frac{1}{4} = \frac{8}{12}
\]

\[
\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}
\]

\[
\frac{2}{3} + \frac{1}{4} = \frac{8}{12} + \frac{3}{12} = \frac{11}{12}
\]

\[
\frac{1}{2} + \frac{1}{3} = \frac{2}{4} + \frac{1}{6} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}
\]

\[
\frac{2}{3} + \frac{1}{4} = \frac{8}{12} + \frac{3}{12} = \frac{11}{12}
\]

CONCLUSION:
Teacher together with pupils deduce the general rule for adding unlike fractions.

Exercise:
Solve
1) \(\frac{1}{5} + \frac{1}{3}\) =
2) \(\frac{2}{7} + \frac{2}{3}\) =
3) \(\frac{7}{8} + \frac{2}{5}\) =

Remark
**Week Ending:** 19/10/2007  
**Class:** P4  
**Subject:** Mathematics

<table>
<thead>
<tr>
<th>Day/ date / duration</th>
<th>Topic/ subtopic</th>
<th>RPK/ Objectives</th>
<th>Teaching-Learning Materials (TLMs)</th>
<th>Teaching-Learning Activities (TLAs)</th>
<th>CORE POINTS</th>
<th>EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day: Friday</td>
<td>Changing fractions to</td>
<td>Objectives:</td>
<td>Square cut outs, marks.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date: 19/10/07</td>
<td>percentages.</td>
<td>By the end of the lesson, the pupils will be able to: 4.9.5 Change at least two fractions to hundredths and to percentages.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration: 60 mins</td>
<td>RPK:</td>
<td>Pupils can write fractions of shared portions on square cut outs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**INTRODUCTION:**
Teacher introduces the lesson by showing to pupils cut out shades and then ask them to write the fractions of the shaded parts.

Mr. Busangah has a square plot of land. He cultivated okro on half of the land. What percentage of the land was used for the okro?

**ACTIVITIES:**

**ACTIVITY 1:**

a) Teacher distributes square cut outs which half of each shaded to represent the portion of the land cultivated. Let pupils divide the square paper horizontally into 10 equal parts and vertically into 10 equal parts (10 x 10).

b) Pupils count the total number of squares and record it as the whole.

c) Pupils count the number of squares in the shaded part and write out its fraction.

\[
\text{Fraction} = \frac{1}{2} = \frac{50}{100} = 50\% 
\]

Total small square = 100, i.e. Whole.  
Small squares in shaded portion = 50.

**ACTIVITY 2:**
Teacher guides pupils change 1/5, 1/4, 2/5 and 2/10 to hundredths and to percentages using similar method.
ACTIVITY 3:
Teacher guides pupils to carry out multiplications to discover how fractions are converted to hundredths and to percentages.

$$\frac{1}{2} = \frac{50}{100} = \frac{1 \times 50}{2 \times 50} = 50\%$$

$$\frac{1}{4} = \frac{25}{100} = \frac{1 \times 25}{4 \times 25} = 25\%$$

$$\frac{2}{10} = \frac{20}{100} = \frac{2 \times 10}{10 \times 10} = 20\%$$

$$\frac{1}{5} = \frac{20}{100} = \frac{1 \times 20}{5 \times 20} = 20\%$$

$$\frac{2}{5} = \frac{40}{100} = \frac{2 \times 20}{5 \times 20} = 40\%$$

CONCLUSION:
Teacher together with pupils deduce a general rule for changing fractions to hundredths and to percentages.

Change the following fractions to hundredths and to percentages:

$$\frac{3}{4} = \%$$

$$\frac{4}{5} = \%$$

$$\frac{3}{10} = \%$$
<table>
<thead>
<tr>
<th>Day / date / duration</th>
<th>Topic / subtopic</th>
<th>RPK / OBJECTIVES</th>
<th>TEACHING-LEARNING MATERIALS (TLMs)</th>
<th>TEACHING-LEARNING ACTIVITIES (TLAs)</th>
<th>CORE POINTS</th>
<th>EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration: 60 mins</td>
<td>UNIT 4:10</td>
<td>By the end of the lesson pupils will be able to</td>
<td>Rectangular cut-outs, ruler, exercise books, pencils etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Topic:</td>
<td>Measures of length and area</td>
<td>1. 4:10:2 Estimate the length of given materials in centimeters.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtopic:</td>
<td>Measure of length</td>
<td>2.</td>
<td>4:10:1 Measure the lengths of the given materials in centimeters (cm).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RPK:</td>
<td>Pupils measure lengths (arbitrary) in their every-day activities e.g. tables, school plots, school field and books.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objectives:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**INTRODUCTION:**

Pupils mention few items that have length e.g. sticks, pens, ropes.

**PRESENTATION:**

**Step 1:** Distribute pencils and exercise books to pupils and allow to compare by estimating which is longer than the other.

Estimate arbitrary

<table>
<thead>
<tr>
<th>Item</th>
<th>length (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise book</td>
<td></td>
</tr>
<tr>
<td>Pencil</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
</tr>
</tbody>
</table>

**Step 2:** Pupils in groups estimate which of the following pairs of materials have equal lengths

- a) pencil: piece of stick
- b) piece of stick: exercise book
- c) pencil: exercise book
- d) rectangular sheet of paper: exercise book

**Step 3:** Pupils estimate the length of the following materials in centimeters.

- a) piece of stick
- b) exercise book
- c) pen
- d) rectangular sheet

**Step 4:** Pupils use ruler to measure lengths of materials in centimeters

- a) piece of stick
- b) exercise book
- c) pen
- d) rectangular sheet of paper

**CONCLUSION:**

Pupils fill a chart to summaries the lesson and display their charts on classroom walls for others to see.

**OBJECTIVES:**

1. Mention few items that have length.
2. Compare the length of your pencil and exercise book.
3. Estimate the pairs of materials that have equal lengths
   - a) pencil: piece of stick
   - b) piece of stick: exercise book
   - c) pencil: exercise book
   - d) rectangular sheet of paper: exercise book
4. Use a ruler to measure accurately the lengths of the following materials.
   - a) piece of stick
   - b) exercise book
   - c) pen
   - d) rectangular sheet of paper
   - e) others
5. Fill in the table below

<table>
<thead>
<tr>
<th>Item</th>
<th>Estimated length (cm)</th>
<th>Actual length (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercise book</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rectangular sheet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piece of stick</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**REMARKS:**

Length refers to the measure of how long a thing or object is from end to end.
<table>
<thead>
<tr>
<th>DAY/DURATION</th>
<th>TOPIC/SUB-TOPIC</th>
<th>OBJECTIVES/R.P.K.</th>
<th>TEACHER/LEARNER ACTIVITIES</th>
<th>CORE POINTS</th>
<th>EVALUATION/EXERCISES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday</td>
<td>Topic: Investigation with numbers</td>
<td>R.P.K: Pupils can add and multiply whole numbers e.g. $0+5=5$ b. $2 \times 3=6$</td>
<td>TLMs: bottle tops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 minutes</td>
<td>Sub-topic: Properties of operations (Addition and multiplication)</td>
<td>Objectives: By the end of the instructional period, the pupils will be able to: 1. complete number sentences involving both addition and multiplication</td>
<td>INTRODUCTION: Use a story problem to review pupils RPK e.g. A teacher gives 4 pupils 3 bottle tops each. How many has he given altogether? Expected answer: $4 \times 3$ bottle tops =12 bottle tops $(3+3+3+3)$ bottle tops =12 bottle tops</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PRESENTATION: ACTIVITIES: 1. Using the bottle tops, let pupils count separately two given numbers say $3+5$ and write them on the board. Then use the bottle tops to add $5+3$ then pupils compare the two answers. 2. Assist the pupils to deduce that $3+5=5+3$ 3. Give pupils more examples to work to come out with the idea that: $a+b=b+a$. 4. Pupils form 3 graphs of 5 counters and another 5 groups of 3 counters and compare the two results. e.g. $3 \times 5=5 \times 3$. Allow pupils to practice using several activities to become conversant with the property. 5. Assist pupils to deduce the commutative property of addition and multiplication. 6. Add 3 to 4 bottle tops to represent $3+4$ and multiply it by 2 to give $2 \times (3+4)$ Assist pupils to use bottle tops to deduce the property $a \times (b+c) = (a \times b) + (a \times c)$ using the activity below. 7. Pupils to make 2 groups of 3 to give $2 \times 3$ and 2 groups of 4 to give $2 \times 4$ and add them together. 8. Help pupils to come out with $2 \times (3+4) = (2 \times 3)+(2 \times 4)$ hence $a \times (b+c) = (a \times b)+(a \times c)$ Distribute the word cards to pupils to answer the questions on them.</td>
<td>The order of the addends does not change the sum and product i.e commutative property e.g $a+b=b+a$ $2+3=3+2$ $a \times b=b \times a$ $3 \times 4=4 \times 3$</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CONCLUSION Pupils answer questions on properties of commutative and distributive on numbers.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

|                     |  |                     |                     |                     |                     |
| Group A consists of 4 pupils with each having 5 bottle tops | Copy and complete the following. a. $6+4=4+\square$ b. $\square+7=7+3$ |  |  |  |  |  |
| Group B consists of 5 pupils with having 4 bottle tops . Which of the following statements is true? a) group A has more bottle tops than B. b) group B has equal number of bottle tops as A. group B has more bottle tops than A |
**WA MUNICIPAL**

Class: P5  
Subject: Mathematics

References:  
- Maths syllabus for primary schools, pg.78-79  
- Maths textbook for primary 5, pg.9-13  
- Trs Manual pg.11-12  
- Inset Sourcebook, pg.54-56

<table>
<thead>
<tr>
<th>Day/ Date /Duration</th>
<th>Topic/ Subtopic</th>
<th>RPK/ OBJECTIVE S</th>
<th>TEACHING –LEARNING ACTIVITIES</th>
<th>TLM</th>
<th>CORE POINTS</th>
<th>EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day: Thursday</td>
<td>Topic: Collecting and handling data.</td>
<td>RPK: Pupils can mention their days of births and their months of births.</td>
<td><strong>INTRODUCTION STAGE:</strong> Teacher introduces the lesson by asking pupils to mention their days of birthday.</td>
<td>Various kinds of bottle tops, rulers (chalkboard ruler), D1(exercise book).</td>
<td>Collecting and interpreting information from data.</td>
<td>Using the table below to draw a bar graph and answer the question that follows.</td>
</tr>
<tr>
<td>Date: 18/10/‘07</td>
<td>Subtopic: Constructing a bar graphs.</td>
<td><strong>ACTIVITIES:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time: 9:30-10:30</td>
<td>Duration: 60 mins</td>
<td></td>
<td><strong>Step1:</strong> Pupils are guided to illustrate their days of births mentioned in a data and record the number of pupils born in each of the days.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>N of plls</td>
<td>S</td>
<td>M</td>
<td>T</td>
<td>W</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Step2:</strong> Using the table above teachers instructs pupils to use the information to construct a bar group, after demonstration by the teacher using blackboard ruler.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Step3:</strong> Pupils are put into groups and the bottle tops distributed to each group.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Step4:</strong> Teacher asks pupils to count the number of bottle tops they have for a drink mentioned.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Step5:</strong> Pupils mention the number(total) and record into their work sheets given.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drinks</td>
<td>Fanta</td>
<td>Coke</td>
<td>Sprite</td>
<td>Malt</td>
</tr>
<tr>
<td></td>
<td></td>
<td>N of bottle tops</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Step6:</strong> Using the complete table and the D1 square paper provided pupils draw a bar graph, with the guidance of the teacher.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>CONCLUSION:</strong> Teacher concludes the lesson by reviewing the main points and asking questions for further understanding.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Using the table below to draw a bar graph and answer the question that follows.

<table>
<thead>
<tr>
<th>PLWAS in U.W.</th>
<th>Year</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>’00</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>’01</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>’02</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>’03</td>
<td>7</td>
</tr>
</tbody>
</table>

i) Which year has the highest infection rate?  
ii) Which year recorded the lowest?
## Subject: Mathematics

**REFERENCES:** Primary Maths, Pupils Book 4 Pages 98-99, Maths Syllabus page 86

### Class: Basic Four

<table>
<thead>
<tr>
<th>DAY</th>
<th>TOPIC/SUB</th>
<th>OBJECTIVE/RPK</th>
<th>TEACHER LEARNER ACTIVITY</th>
<th>TLMs</th>
<th>CORE POINTS</th>
<th>EVALUATION AND REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday</td>
<td>Measurement of Length and Areas</td>
<td>RPK:</td>
<td>I INTRODUCTION: Let pupils measure their books, desk and the classroom using arbitrary unit.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date: 24/10/07</td>
<td>Duration: 60 Minutes</td>
<td>SUB-TOPIC: Measurement of Length</td>
<td>ACTIVITY ONE Put pupils in groups, distribute materials to them and allow them to compare by estimating which one is longer than the other.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OBJECTIVE(S)**

By the end of the lesson the pupil will be able to:

i) estimate and compare the length of the given materials.

ii) measure the length of the materials in centimeters.

**RPK:**

Pupils measure lengths (arbitrary) in their everyday activities. Eg Tables, Classroom and Books

### INTRODUCTION

Let pupils measure their books, desk and the classroom using arbitrary unit.

### ACTIVITY ONE

Put pupils in groups, distribute materials to them and allow them to compare by estimating which one is longer than the other.

<table>
<thead>
<tr>
<th>Item</th>
<th>Arbitrary unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise book</td>
<td></td>
</tr>
<tr>
<td>Pencils</td>
<td></td>
</tr>
<tr>
<td>Pens</td>
<td></td>
</tr>
</tbody>
</table>

### ACTIVITY 2

Pupils in groups estimate which of the following have equal length.

i) Pen: piece of stick  
ii) Exercise books: rectangular piece of paper  
iii) Pen: Exercise book

<table>
<thead>
<tr>
<th>ACTIVITY 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pupils in groups estimate the length of the following materials in centimeters.</td>
</tr>
<tr>
<td>i) Exercise books.</td>
</tr>
<tr>
<td>ii) Pens</td>
</tr>
<tr>
<td>iii) Rectangular sheets of papers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACTIVITY 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pupils use rulers to measure lengths of the following in centimeters.</td>
</tr>
<tr>
<td>i) Exercise books.</td>
</tr>
<tr>
<td>ii) Pens</td>
</tr>
<tr>
<td>iii) Rectangular sheets of papers</td>
</tr>
</tbody>
</table>

**CONCLUSION:**

Pupils fill a chart to summarize the lesson and display their chart on classroom walls.

**Unit for the measure of length are in millimeter (mm), centimeter (cm) and meter (m).**

- Compare the length of your pen and exercise book.
- Estimate the pairs of materials that have equal length.
  - i) Pen: piece of stick  
  - ii) Exercise book: piece of stick  
  - iii) Pen: exercise book  

Fill in the table below:

<table>
<thead>
<tr>
<th>Material</th>
<th>Estimated length (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pen</td>
<td></td>
</tr>
<tr>
<td>Exercise book</td>
<td></td>
</tr>
<tr>
<td>Rectangular sheet of paper</td>
<td></td>
</tr>
<tr>
<td>A piece of stick</td>
<td></td>
</tr>
<tr>
<td>Day/</td>
<td>Topic/</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Date: 23/10/07</td>
<td>Factors and Prime Numbers. Finding factors of a given number and sorting out prime numbers from a given set of numbers.</td>
</tr>
</tbody>
</table>

**INTRODUCTION:**
Tr displays some geometrical shapes on the board, pupils identify the shapes and name them.

**DEVELOPMENT**
Activity 1
Pupils form rectangular array with area equals to the number of counters representing the given number.
Rectangular Arrays

<table>
<thead>
<tr>
<th>Number</th>
<th>Arrays</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>![Array 6]</td>
</tr>
<tr>
<td>8</td>
<td>![Array 8]</td>
</tr>
<tr>
<td>5</td>
<td>![Array 5]</td>
</tr>
</tbody>
</table>

Activity 2

Using the counters, pupils form all the possible rectangular arrays of a given number whilst Tr. goes round to help other pupils in difficulty. Eg

1) 12 = ![Array 12]

2) 15 = ![Array 15]

(Pupils put down all possible dimensions by which a particular quantity could be arranged in a rectangular array.)

Area of Arrays

<table>
<thead>
<tr>
<th>Number</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>2 x 3 (2 groups of 3)</td>
</tr>
<tr>
<td>8</td>
<td>4 x 2 (4 groups of 2)</td>
</tr>
<tr>
<td>5</td>
<td>1 x 5 (1 group of 5)</td>
</tr>
</tbody>
</table>

Area of Arrays

12 = 1 x 12

= 2 x 6

= 3 x 4

15 = 1 x 15

= 3 x 5
ACTIVITY 3
Pupils use grouping such that each sub-group contains the same number of counters whilst Tr help them to come out with a rule to generate all the factors of a given number. eg.

<table>
<thead>
<tr>
<th>Grouping</th>
<th>Algorithm</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 = [〇〇〇〇〇〇]</td>
<td>1 x 6</td>
</tr>
<tr>
<td>〇〇</td>
<td>〇〇</td>
</tr>
<tr>
<td>〇〇</td>
<td>〇〇</td>
</tr>
<tr>
<td>〇</td>
<td>〇</td>
</tr>
<tr>
<td>〇</td>
<td>〇</td>
</tr>
</tbody>
</table>

Factors of 6 = \{1,2,3,6\}

9 = [〇〇〇〇〇〇〇]
1 x 9
〇〇〇 | 〇〇〇 | 〇〇〇 | 3 x 3

Factors of 9 = \{1,3,9\}

ACTIVITY 4
A chart of natural numbers with their corresponding factors is formed under the guidance of the teacher for pupils to identify

1. Numbers with their corresponding factors
2. Numbers with exactly two factors (prime numbers)

CHART

<table>
<thead>
<tr>
<th>No</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>{1}</td>
</tr>
<tr>
<td>2</td>
<td>{1,2}</td>
</tr>
<tr>
<td>3</td>
<td>{1,3}</td>
</tr>
<tr>
<td>4</td>
<td>{1,2,4}</td>
</tr>
<tr>
<td>5</td>
<td>{1,5}</td>
</tr>
<tr>
<td>\vdots</td>
<td>\vdots</td>
</tr>
<tr>
<td>20</td>
<td>{1,2,4,5,10,20}</td>
</tr>
</tbody>
</table>

Prime Number
Any number with exactly two factors, that is 1 and the number itself. eg 2,3,5,7,11 etc

Factors
Factors of a number are those numbers that can divide the given number exactly eg.
Factors of 15 are 1,3,5 and 15

Class exercise:
1. Using rectangular arrays, find all the factors of
   a) 10
   b) 18
   c) 20
   d) 7

2. List all the number / numbers that has only one factor.

Homework
Try and find all the prime numbers that exist between 1 and 20.

Remarks:
### Theme: learning for resource development

**Class:** Primary six  
**Subject:** Mathematics  
**Week ending:**

<table>
<thead>
<tr>
<th>Day/ date/ duration</th>
<th>Topic / subject/ content</th>
<th>RPK / Objective</th>
<th>Teaching – learning activities/ key words.</th>
<th>TLM s</th>
<th>Core Points</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UNIT 6.9</strong></td>
<td><strong>TOPIC:</strong> Shape and space</td>
<td><strong>Subtopic:</strong> solid/ space figures</td>
<td><strong>RPK:</strong> Pupils handle and play with common solids at home. Pupils can identify type of polygons. <strong>OBJECTIVES:</strong> by the end of the lesson pupil will be able to: 1). Identify solids 2). group or classify solid shape according to a given criteria</td>
<td><strong>KEY WORDS:</strong> Cuboids, cube, cone, cylinder, sphere, pyramid , edge, face, vertices, base. <strong>INTRODUCTION:</strong> Pupils mention common solids that they play with or use at home or school. Example; matchbox, milk tins football, etc. <strong>ACTIVITY 1:</strong> Pupils identify and group or classify solid shapes according to: a). Number of faces b). types of faces c). number of edges d). number of vertices</td>
<td>Solid shapes/ space figures are three dimensional in shape. for example match box, cube. Solids have faces, edges and vertices. An edge is the meeting place of two faces. The vertex is the point where two or more edges meet. The face is the space bounded by three or more edges.</td>
<td>Name two things that have shapes of a). cylinder b). cuboid. c). cone d). cube</td>
</tr>
<tr>
<td>60 min</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### ACTIVITY 2:

Let pupils make a table and record the properties of solids

<table>
<thead>
<tr>
<th>Name of solid</th>
<th>Number of faces</th>
<th>Number of edges</th>
<th>Number of vertices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuboid</td>
<td>6</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Cube</td>
<td>6</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Cylinder</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Sphere</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cone</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Triangular Pyramid</td>
<td>4</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Rectangular pyramid</td>
<td>5</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Hexagonal pyramid</td>
<td>7</td>
<td>12</td>
<td>7</td>
</tr>
</tbody>
</table>

Conclusion: Guide pupils to come out with a general rule connecting number of faces, edges and vertices

**CONCLUSION:**

Guide pupils to come out with a general rule connecting the numbers of faces, edges and vertices. ie. \( E = F + V - 2 \)
PUPILS WORK SHEET

Topic: Shape and space  
Subtopic: solids or space figures

class: Primary six
Date: October 2007
Time: 60 min

Instruction:

A). group the solids according to the following criteria:
   1) number of faces
   2) type of faces
   3) number of edges
   4) number of vertices
   5) give the names of solid classified

B) using the results of (A) above, complete the following table.

<table>
<thead>
<tr>
<th>Name of solid</th>
<th>Number of faces</th>
<th>Number of vertices</th>
<th>Number of edges</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**References:** Foundation mathematics, teacher’s guide, pg 85.
Foundation mathematics, pupil’s book six, pg 90.
Teaching syllabus for mathematic I primary schools, pg 127, 6.9.1, 6.9.2.

<table>
<thead>
<tr>
<th>Day/ date / duration</th>
<th>Topic/ subtopic</th>
<th>RPK / OBJECTIVES</th>
<th>TEACHING -LEARNING ACTIVITIES</th>
<th>TLM</th>
<th>CORE POINTS</th>
<th>EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 min</td>
<td>Topic: Collecting and handling data. Subtopic: Collecting and recording data.</td>
<td>RPK: Pupils can count objects and record the results. Objectives: By the end of the lesson pupil will be able to: i). Collect data that involves counting. ii). Make and interpret a frequency tables.</td>
<td>INTRODUCTION Teacher asks one pupil to count the number of boys in the class. Ask another pupil to count the number of girls in the class. teacher writes the results on the chalk board</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ACTIVITY 1 Tr takes the data on the day of the week the children were born: Procedure: i). Tr. asks the pupils who were born the Monday to stand up. ii). Do the same for pupils who were born on the Tuesday, Wednesday, Thursday, Friday, Saturday and Sunday. Record the results on the chalk board. iii). Tr. draws a sample table with the results.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Days of the week pupils were born.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Birth Day</td>
<td>Tally Marks</td>
<td>Total (Frequency)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Monday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tuesday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wednesday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Thursday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Friday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Saturday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sunday</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Collecting data:** Data is a piece of information gathered about objects. Example : type of color, ages of people, food items in a shop, the number of girls or the number of boys in a class.

**Tally marks** are line strokes to indicate the number of times an object/items is counted in a data collected.

**Frequency** refers to how many times a particular item occur in a data.
Activity 2

i). Pupils are put in ten groups. Tr. distributes TLMs with worksheets to each group and asks them to identify the TLMs.

ii). Tr. Asks each group to make a frequency table out of the TLMs provided. As shown below:

<table>
<thead>
<tr>
<th>Item</th>
<th>Tally marks</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marble</td>
<td>///</td>
<td>/6</td>
</tr>
<tr>
<td>Bottle tops</td>
<td>/// // //</td>
<td>17</td>
</tr>
<tr>
<td>sticks</td>
<td>///</td>
<td>/4</td>
</tr>
<tr>
<td>Milk tins</td>
<td>/// ///</td>
<td>/3</td>
</tr>
</tbody>
</table>

Use the table to answer the following question:
a). How many items are recorded all together?
b). Which item has the least number?
c). Which item has the highest number?

Report, Summary and Conclusion.
Tr. Calls each group leader to present their results. Teacher summarizes the results and concludes the lesson.
Pupils name two daily life activities at home, school, or the market in which data collection and data recording take place.
Pupils relate to the activity that their group has just done, to state one major importance of data collection and data recording in our day to day activities.

<table>
<thead>
<tr>
<th>Item</th>
<th>Tally marks</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marble</td>
<td>///</td>
<td>/6</td>
</tr>
<tr>
<td>Bottle tops</td>
<td>/// // //</td>
<td>17</td>
</tr>
<tr>
<td>sticks</td>
<td>///</td>
<td>/4</td>
</tr>
<tr>
<td>Milk tins</td>
<td>/// ///</td>
<td>/3</td>
</tr>
</tbody>
</table>

a). 6 + 17 + 4 + 3 = 30
b). milk tins
c). bottle tops

Selling and buying, we count money and items and record their values/quantity.
We count different items at home to prepare food.
We keep farm records.
Data collected give varied qualitative and quantitative information about an object; colour, number, height, size,

To the pupils

Project: market survey:
Survey your market and list
The number of stores that sell
a). bread
b). kenkey
c). oil
d). fish
e). electric bulbs.

Put this information
In the frequency table form and submit it on Monday 22 /10/07.

Reflective Remarks:………………………………………………………………………………………………………………………………………
………………………………………………………………………………………………………………………………………

Prepared by: Eunice Awovafoge (CL) and Samuel Kelinza (CL)
Kassena Nankana District, Navrongo.
PUPILS WORK SHEET

Name of school: ................................................................. Class: primary six.
Topic: collecting and handling data. Date: ….. October 2007. Duration: 60 min.
Subtopic: collecting and recording data.

Instructions

1. Sort out and Group the objects of the same kind / like items together
2. Count the number of like items in each group while tallying each count with a tally mark by its name.
3. Write down the number of times (frequency of) each like item occurred in a group.
4. Used the information above to complete the table below.

Frequency table of objects

<table>
<thead>
<tr>
<th>ITEM / OBJECTS NAME</th>
<th>Tally marks</th>
<th>Total number of items (frequency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marble</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottle tops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sticks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk tins</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use the information in the table to answer the following questions:

1. How many items are recorded all together?
2. Which item has the least number of counts (the lowest frequency).
3. Name the item that had been counted more than the others (with the highest frequency).
4. Name two daily life activities at home, school, or the market in which data collection and data recording take place.
5. Relate to the activity that you group has just done, state one major importance of data collection and data recording in our day to day activities.
SUBJECT: Mathematics

R.P.K. Objectives

Teaching/Learning Activities

T.L.M.

Core Points

Evaluation/Remarks

Friday 19/10/07
60 mins

Topic/ Sub-topic
Addition (0-20)
Number and Numerals

R.P.K.
Pupils can write numbers up to 20.

Objectives
By the end of the stipulated time, the pupils will be able to:
1. Arrange different numbers (one digit numbers) on the number wall to get a particular sum (one digit number or 2 digit number).
2. Tell which number is the highest and which is the lowest number that can be added using the number wall.

Introduction:
Call pupils in pairs, one mentions a number and the other comes out to write on the chalkboard, continue this activity until you get the first 20 numbers. (counting numbers)

Write the day’s topic on the board and tell pupils that the numbers they have mentioned and written are going to be put together in pairs to get a result.

Activities:
1) Pupils are put into groups and appoint group leaders.
Call the leaders for the materials and let them observe for a while.
2) Guide them by demonstrating first to pupils how to add 2 numbers on the number wall.

e.g.

Use the number wall to add the following sums; 5 and 7.

The two numbers at the bottom of the wall add up to get the top number on the wall.

Addition by adding another wall, e.g.:

Two numbers at every level add up to the number at the top. So 5+4=9 and 4+2=6 and 9+6=15 at the top.
The highest number which can be added is 17 and the lowest 7. Numbers which cannot be added this way are: 0, 1, 2, 3, 4, 5, 6, 7, 18, 19 and 20.

List the numbers which is the highest and the lowest number which can be added using the number wall up to 20.

Conclusion:
Pupils try more examples in their jotters.

Chalkboard Illustration

Number Wall

Addition of two numbers on the number wall, e.g.:

Addition by adding another wall, e.g.:

Pupils continue the activity and sort out numbers which cannot be added using the material.

5) Pupils also find out which number is the lowest number that can be added using the material and write their finding.
NUMBER WALLS

1 2 3
4 5 6
7 8 9
10 0 11
12 13 14
15 16 17
18 19 20
### TAMALE METRO

**6th Week Ending: 19th October, 2007**  
Class: P6  
Subject: Mathematics

**References:** Teaching Syllabus for Maths(Prim1-6), Unit6.9, page 127.  
Teacher’s Handbook Unit  
Pupils Textbook (6) Unit

<table>
<thead>
<tr>
<th>Day/ date/ duration</th>
<th>Topic/ subtopic</th>
<th>RPK/ OBJECTIVES</th>
<th>TEACHING – LEARNING ACTIVITIES</th>
<th>TLMs</th>
<th>CORE POINTS</th>
<th>EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day: Thursday</td>
<td>Topic: Collecting and handling data.</td>
<td>RPK: Pupils can count objects and record their number.</td>
<td><strong>INTRODUCTION:</strong> Ask one pupil to count the number of table in the class, another the number of pupils in the class and record their findings on the c/b.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Date: 18/10/'07     | Subtopic: Representing data using pictograph. | Objectives: By the end of the lesson pupil will be able to;  
1. Represent given data using pictograph and answer at least two questions correctly on it.  
2. Draw a frequency table using information in the pictograph. | ACTIVITIES:  
ACT 1: Put pupils into groups of five with leaders and distribute discrete objects to them to identify and sort them into groups according to their names.  
ACT 2: Pupils arrange brand of bottle tops to show pictograph horizontally count and record their findings on each brand.  
ACT 3: Pupils in their groups use information in the pictograph to draw a frequency table on given sheets of paper with c/b illustrations. | | | |
| Duration: 30mins    | | | **CONCLUSION:** Pupils collect bottle tops from any nearest drinking bar at home and find out which brand people like most and which brand bar keepers will like to sell. | | | |
|                     | | | | | | |

**Brands of bottle tops**  
- star  
- gunder  
- guiness  
- fanta

<table>
<thead>
<tr>
<th>Bottle top</th>
<th>Stroke/ tally</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Star</td>
<td>///</td>
<td>8</td>
</tr>
<tr>
<td>Gunder</td>
<td>///</td>
<td>6</td>
</tr>
<tr>
<td>Guiness</td>
<td>///</td>
<td>7</td>
</tr>
<tr>
<td>Fanta</td>
<td>///</td>
<td>8</td>
</tr>
</tbody>
</table>

**Frequency table**  
Frequency means number of times something occurs; given by stroke/tally.

1. Name any two brands of bottle tops.  
2. Which brand bottle tops has  
a) more bottle tops  
b) less bottle tops  
3. How many people like  
a) star?  
b) gunder?  
c) guiness?  
d) danta?
**Week ending:**
**Subject:** Mathematics  
**Class:** Primary 6

<table>
<thead>
<tr>
<th>Day/ date/ duration</th>
<th>Topic/ subtopic</th>
<th>RPK/ OBJECTIVES</th>
<th>TEACHING-LEARNING ACTIVITIES (TLAs)</th>
<th>TLMs</th>
<th>CORE POINTS</th>
<th>EVALUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day: Wednesday</td>
<td>Topic: Fractions</td>
<td>RPK: Pupils can multiply a fraction by a whole number.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date: 24/10/07</td>
<td>Subtopic: Multiplication of a fraction by a fraction</td>
<td><strong>Objectives:</strong> By the end of the lesson pupils will be able to:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration: 60 mins</td>
<td></td>
<td></td>
<td><strong>INTRODUCTION (5 mins)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1. Teacher receives with pupils multiplication of a whole number by a fraction of (4 \times \frac{1}{2}), (2 \times \frac{1}{2})</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>ACTIVITIES (10 mins)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Teacher gives pupils the following problem (put it on a manuial card)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mr. Abam had a piece of farm land measuring one acre square. Mansa’s father bought (\frac{1}{3}) of the land and give (\frac{1}{2}) of it to Mansa. What fraction of the land was given to Mansa?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Teacher helps pupils to solve above problem. Supply square sheets of paper to represent the plot of land to pupils.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Teacher guides pupils to fold the paper into 3 equal parts vertically and shade a third of it.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Teacher guides pupils to fold the sheet again into halves and shade one half of it in another way.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6. Pupils identify the region with shading as Fati’s portion of the plot that is (\frac{1}{2}) of (\frac{1}{3}).</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Key Word List:**  
Fraction number, denominator  

**References:**  
Mathematics Syllabus 1-6 pg16  
Primary Mathematics bk 6 (Unimax Macmillan) pg16  
Primary Mathematics Bk 6 (Smartline Basic Education Series) pg38
7. Teacher gives another problem as in step 1. Pupils should follow the same steps above.

Mr. Adamu had a plot of land in the shape of a square of side 1 km. Fati’s father bought 3/4 of the land and gave 2/3 of it to Fati. We went to find out the fraction of the plot Fati got. Put pupils into groups to do this.

8. Group work: Teacher gives sheets to pupils. Ask pupils to follow instruction of example a and 2 without folding papers to get the answers. That is pupils count and describe the meaning of the numerator and the denominator of the answer.

**Conclusion**

Teacher summarises the lesson by asking pupils questions on the procedure of multiplying a fraction by a fraction.

**Work cards**

In multiplying find the product of the numerators divided by product of denominators.

\[
\frac{2}{3} \times \frac{3}{4} = \frac{2 \times 3}{3 \times 4} = \frac{6}{12}
\]

**Homework**

1. \(\frac{2}{5} \times \frac{3}{8}\)
2. \(\frac{2}{4} \times \frac{1}{3}\)
3. \(\frac{1}{4} \times \frac{1}{4}\)
4. \(\frac{2}{3} \times \frac{4}{5}\)
5. \(\frac{3}{5} \times \frac{c}{d} = \frac{12}{20}\)
### Topic: Investigation of Numbers
#### Sub-Topic: Triangular Numbers

**Objectives:**
- By the end of the study, the pupils will be able to find the pattern of triangular numbers up to the 10th term.

**RPK:**
- Pupils can identify triangles.

<table>
<thead>
<tr>
<th>Term</th>
<th>Pattern</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>1+2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>1+2+3</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>1+2+3+4</td>
<td>10</td>
</tr>
<tr>
<td>etc</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Introduction:**
Teacher revises the previous lesson with pupils briefly by identifying a triangle amongst the given shapes.

**Presentation:**
- **Step 1:** Teacher distributes bottle tops to groups.
- **Step 2:** Teacher introduces triangular number building to look like this triangle "▲." Pupils observe teacher demonstrate the first four terms.

**Step 3:** Teacher asks pupils to build up the next four patterns using the bottle tops.

**Step 4:** Teacher asks pupils to predict the number of bottle tops of pattern 9, 10 and 11 without using bottle tops.

**Step 5:** Pupils investigate the pattern of triangular numbers using bottle tops by completing the given table.

**Pattern development:**
\[1 + 2 + 3 + 4 + \ldots + 10\]

**TLM's**
- Bottle Tops
- Manila Cards

**Core Points**
- Representation
### Step 6
Pupils present their own findings to other groups in the class for verification.

### Step 7
Teacher guides the pupils to observe the totals eg. 1, 3, 6, 10, Y ....

Pupils note the constant order, pattern, or sequence, or term having a common difference.

**CONCLUSION:**
Pupils choose triangular numbers from a range of counting.

---

### Exx.
Study the following and write down the next 3 terms:

a. 1, 3, 5, 7, ... 

b. 2, 6, 10, 14, ... 

c. (1, 0), (2, 3), (3, 6), (4, 9), ( ), ( ), ( )
**DANGME WEST**

**Class:** Primary 6  
**Subject:** Mathematics  
**References:** 1. SYLLABUS PG. 133  
2. PUPILS MATHEMATICS TEXT BK. PG. 182-184 CLASS SIX (6)

<table>
<thead>
<tr>
<th>Day/ date/ duration</th>
<th>Topic / subject/ content</th>
<th>RPK / Objective</th>
<th>Teaching – learning activities</th>
<th>TLMs</th>
<th>Core Points</th>
<th>Evaluation / RMKs</th>
</tr>
</thead>
</table>
| **60 min**           | **TOPIC:** Chance         | **OBJECTIVES:** | By the end of the lesson, the pupils will be able to: 6.14.1 list all the possible outcomes of a situation | Coin, Sacks, Marbles | Ludo, Playing Cards, Coin tossing. There are two possible outcomes of selecting 2 different marbles from a sack (i.e. colour Red or White) W = Colour White, R = Colour Red | **Exx.:**
|                      | **SUB-TOPIC:** Listing all possible outcomes of a situation | **INTRODUCTION:** | Ask pupils to name some games that depend on luck. | **ACTIVITY:**
|                      |                           | **OBJECTIVES:** | 6.14.1 list all the possible outcomes of a situation | **ACTIVITY 1:**
|                      |                           | **RPK:** | Pupils play games that depend on luck. | Guide pupils to perform experiments on marble selections and record all the possible outcomes. | **ACTIVITY 2:**
|                      |                           | **Teaching – learning activities** | **RPK:** | Guide pupils to toss a coin several times and record the possible outcomes of tossing that coin. | **ACTIVITY 3:**
|                      |                           | **Core Points** | **RPK:** | The groups interchange activities. | **CONCLUSION:**
|                      |                           | **Evaluation / RMKs** | **RPK:** | Pupils read the finding of their groups to class. | **Remarks:**

**ACTIVITY:**

**Activity 1:**
Guide pupils to perform experiments on marble selections and record all the possible outcomes.

**Activity 2:**
Guide pupils to toss a coin several times and record the possible outcomes of tossing that coin.

**Activity 3:**
The groups interchange activities.

**CONCLUSION:**
Pupils read the finding of their groups to class.

---

**Remarks:**

Exx.:

(a) Draw a tree diagram for tossing a fair coin four times.

(b) How many possible outcomes are there?

(c) How many times is it possible to get two heads and two tails?

There are 8 possible outcomes of selecting 2 different marbles from a sack (i.e. colour Red or White). There are 8 possible outcomes of tossing a coin fairly. This is called a "Tree Diagram"