

UNICEF Education Kit Handbook

Mathematics Kit Guidance



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INTRODUCTION

The UNICEF Education in Emergencies (EiE) Handbook is a tool that provides training and curricular guidance in support of UNICEF pre-packaged education kits. This is the first version of the handbook and it has only been partially field tested. As such, all feedback is critical and welcome to help inform the planned revision. Please contact the Education Unit at UNICEF Supply Division with all relevant input, criticism and suggestions.

The handbook is available in French and English. Each education kit shipped from Supply Division will contain the relevant module. Module One, the overall guidance module, is available upon request, or on the UNICEF website, along with all the other modules.

ACKNOWLEDGEMENTS

The Handbook was developed over eighteen months by UNICEF staff from the Programme Education sections in New York and Geneva and from Supply Division in Copenhagen. This document was developed through a consultative process led by a consultant that was guided by a reference group composed of UNICEF staff from Country Offices, Regional Offices and HQ locations. It was also independently reviewed at various stages by other UNICEF staff. A special thank you goes to all those who supported this project.

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KEY TERMINOLOGY

Definition of Child: The terms child and children refer to all children and young people from birth to 18 years of age, as specified in the UN Convention on the Rights of the Child. If a particular age group of children is intended, this will be made clear in the text.

Age groups: It is important to highlight that age groups can vary according to context and culture. Indicatively the Handbook targets the age groups below:

- 1) **Infants, toddlers** and **pre-school children** approximately from birth to seven/eight years.
- 2) **Young adolescents** between ten and fourteen years.
- 3) **Older adolescents** between fifteen and nineteen years.
- 4) **Youths** are adolescents and young adults between the ages of fifteen and twenty-four years

(Reference: United Nations definitions)

Definition of Pupil(s) and Student(s): Terms pupil(s) and student(s) refer to children taught by a teacher. They are interchangeable.

Definition of Instructor(s), Caregiver(s) and Teacher(s): The term instructor(s) refers to the personnel implementing the semi-structured recreational activities (Module Two). The term caregiver(s) refers to the personnel implementing early childhood education activities (Module Three). The term teacher(s) refers to the personnel implementing basic primary education and primary mathematics and science education (Module Four, Module Five and Module Six). **NOTE** *Volunteers are non-paid members of the local community who voluntarily help in the implementation of the activities. They are not members of staff but they should sign a Code of Conduct.*

Definition of Trainer(s): The term trainer(s) refers to the personnel delivering the training to instructors, caregivers and teachers (Module One).

Definition of Trainee(s): The term trainee(s) refers to those who receive training. They can be (1) the trainers during the Training of Trainers (TOT) or (2) the instructors, caregivers and/or teachers receiving the training from the trainers.

Definition of Child-Friendly Spaces/Environment(s): The term Child-Friendly Spaces/Environment(s) (CFS/Es) is used in a broad sense. It is important to highlight that there is a broad and developing literature on the definition(s) of CFS/Es that involves different disciplines. Also the terminology used to indicate CFS/Es can vary among agencies. In the Handbook the term CFS/Es can refer to:














- CFS/Es, which are 'places designed and operated in a participatory manner, where children affected by natural disasters or armed conflict can be provided with a safe environment, where integrated programming including play, recreation, education, health, and psychosocial support can be delivered and information about services/supports is provided. Generally Child-Friendly Spaces refer to relatively short to medium term programme responses. They are very often operated from tents and/or temporary structures (e.g. in schools, under a tree or a vacant building).' UNICEF, 2009, *A Practical Guide for Developing Child-Friendly Spaces*, p.9.

- Temporary Learning Spaces (TLS), which are set up in the immediate aftermath of an emergency.
- Alternative Learning Spaces (ALS), which can be 'set up just about anywhere according to the context. Alternative learning spaces can be churches, mosques, temples, community halls, rooms within the community chief's office, libraries, a compound, allocated land and an unused room in a private house or even a boat'. UNICEF, 2009, '*Child Friendly Schools Manual*', Chapter 4, p.22.
- Existing or rehabilitated schools.
- Child Friendly Schools (CFS) as defined in the UNICEF, 2009, '*Child Friendly Schools Manual*'.

Three key reference documents, which can be downloaded via the UNICEF website, provide further information on Child Friendly Spaces: **(1)** '*A Practical Guide for Developing Child-Friendly Spaces*', UNICEF, 2009; **(2)** '*Guidelines for Child Friendly Spaces in Emergencies*', 2011, Field-testing version developed and reviewed by the Global Education Cluster, Global Protection Cluster, INEE and IASC; **(3)** '*Child Friendly Schools Manual*', UNICEF, 2009, New York.

KEY GRAPHIC MARKS:

The following icons aim at facilitating the comprehension of the text:

- | | | | |
|-----|---|--------------------------|---|
| 1. |  | KEY MESSAGE | summarises important learning content in a nutshell. |
| 2. |  | TRAINING | provides indications on how to convey the KEY MESSAGES during the training session. |
| 3. |  | NOTE | indicates a suggestion, tip, encouragement, clarification and idea. |
| 4. |  | THINK | invites readers to reflect on their own experience and context. |
| 5. |  | LEARNING OUTCOMES | indicates what is expected to be learned. It can help in monitoring and evaluating the progress of learning. |
| 6. |  | TABLES | are lists of items. |
| 7. |  | PICTURES | are visual examples of key concepts described in the text. |
| 8. |  | BOX | summarises general contents and helps to visualise them all together. |
| 9. |  | SAMPLES | are examples of what teachers and caregivers are expected to do. |
| 10. |  | YOUR ROLE | summarises what is expected from the trainer in Module One and from the instructors, caregivers and teachers in Modules Two, Three, Four, Five and Six. |
| 11. |  | CASE STUDY | are examples of education interventions already implemented. |
| 12. |  | CHECK LIST | indicates important points to consider before and during the implementation of the activities. |
| 13. |  | ACTIVITY | indicates the beginning of a new chapter in a unit. |

INTRODUCTION TO TEXT

1. Rationale of the EiE Handbook

The right to education is most at risk during emergencies and during the transition period following a crisis. In conflict-affected countries, 28 million children of primary school age were out of school in 2011 – 42 per cent of the world total. Only 79 per cent of young people are literate in conflict-affected countries, compared with 93 per cent in other poor countries. Moreover, children living in conflict are twice as likely to die before their fifth birthday as children in other poor countries.

The Core Commitments for Children in Humanitarian Action – the CCCs – constitute UNICEF’s central humanitarian policy to uphold the rights of children affected by humanitarian crisis. They are a framework for humanitarian action, around which UNICEF seeks to engage with partners. The updated CCCs continue to promote predictable, effective and timely collective humanitarian action and to clearly outline the areas in which UNICEF can best contribute to results including education.

In addition, the Inter-Agency Network for Education in Emergencies (INEE) has developed the Minimum Standards Handbook. The Handbook is designed to give governments and humanitarian workers the tools they need to address the Education for All movement and the UN Millennium Development Goals (MDGs). It is the first step toward ensuring that education initiatives in emergency situations provide a solid and sound basis for post-conflict and disaster reconstruction. Both instruments have been complementary and critical in the preparedness and response of the Inter-Agency Standing Committee (IASC) Humanitarian Reform launched in 2005 that established the education cluster approach.

UNICEF believes that education is not only a basic human right; it is an instrumental strategy for supporting recovery. It not only restores schooling and all its related benefits to affected people, it also helps countries transform and rebuild the institutions and systems destroyed during the emergency. Re-establishing education after an emergency not only safeguards children’s fundamental right to education, it also plays a critical role in normalising their environment. This helps them overcome the psychosocial impact of disasters and conflict.

Back-to-School (BTS) Initiatives: a strategy to put into action the CCCs

UNICEF and partners coordinate with Ministries to provide safe temporary learning spaces; teaching and learning materials; and training of teachers, parents, education officials and others to provide quality education, reduce drop-out and promote student retention. In essence, the BTS initiative offers a way to put the CCCs into practice.

With the introduction of the first UNICEF-supported BTS Initiative after the Rwandan genocide in 1994, these initiatives have become a powerful first response and strategy in facilitating access to protective learning environments for approximately 27 million children affected by conflict and natural disasters. These initiatives have been implemented with great success in over 55 countries in the period 1994-2012, including Afghanistan, Côte d’Ivoire, Haiti, Lebanon, the State of Palestine, South Sudan, and Uganda. BTS Initiatives are characterised by 1) the establishment of robust targets for numbers of children to return to some form of education as quickly as possible after the onset of the emergency, 2) rapid deployment of education supplies in the form of kits as well as teaching and learning materials to aid in resumption of education, 3) establishment of some form of temporary learning infrastructure as needed, combined with the rapid

repair of damaged schools, and 4) intensive advocacy, communication and social mobilisation efforts with governments, communities, donors and partner organizations.

The Handbook aims at providing training and curricular guidance related to existing pre-packaged materials or kits. It is intended to strengthen the impact of UNICEF from the initial first response of pedagogical supplies to one of fostering learning, growth and development. With the Handbook, the education kits, and proper teacher training, it will be possible to extend the utility of the individual kits, improving the quality of the initial education response in BTS initiatives.

2. Objectives of the Handbook

- a) To provide curricular guidelines and instructions on how to use the teaching aids contained in the kits for teachers, caregivers and instructors working in emergency contexts. A printed copy of each curriculum is contained in the related kit.
- b) To provide training guidelines for the trainers involved in the emergency response.

The complete Handbook is available for download via the UNICEF website.

3. Overview of the Handbook

BOX 1: Overview

| MODULE | CURRICULUM | KIT | TARGET GROUP(S) |
|--------------|--|-------------------------------------|-----------------|
| Module One | Guidelines for Training of Trainers | No specific kit | Trainers |
| Module Two | Recreation Kit Guidance | Recreation Kit | Instructors |
| Module Three | Early Childhood Development Kit Guidance | Early Childhood Education (ECD) Kit | Caregivers |
| Module Four | School in a Box Kit Guidance | School-in-a-Box (SiB) Kit | Teachers |
| Module Five | Mathematics Kit Guidance | Primary Mathematics Kit (PMK) | Teachers |
| Module Six | Science Kit Guidance | Primary Science Kit (PSK) | Teachers |

4. Target groups of the Handbook

The Handbook targets three groups:

a) The actors involved in the preparedness and coordination of the education response to emergencies.

These actors are responsible for purchasing the teaching aids, identifying and setting up the learning spaces and providing the training of trainers and of teachers, caregivers and instructors according to the contextual needs and priorities. They are UNICEF personnel from HQ, Regional and/or Country Offices and Focal Points and representatives of the Ministry of Education (MOE) or other Education Authorities involved in the preparedness and coordination of the education response in emergencies. They can be members of staff of Implementing Partners (IP) such as International Non-Governmental Organizations (INGOs), National Non-Governmental Organizations (NGOs) and local Community Based Organizations (CBOs) and/or practitioners.

- b) **The trainers** involved in the training of teachers, caregivers and instructors before (pre-service training) and possibly also during (in-service training) the response to the emergency according to the specific contextual needs. Usually the EiE/C trainers are trained in advance and are strategically positioned, for example in Regional Offices, in order to provide a rapid response to emergencies.
- c) **The teachers, the caregivers and the instructors** who directly implement the EiE curricula with the support of the teaching aids contained in the related education kit.

5. Overview of the UNICEF Education Response in Emergencies

The UNICEF education response in emergencies takes a ‘**phased-approach**’. Box 2 below provides an overview by phase. It is important to highlight that the Handbook can also be used in **non-emergency** settings.

BOX 2: Overview of the UNICEF Education Response in Emergencies

| PHASE | TIME-LINE | ACTIVITIES |
|---------------------|---|---|
| PHASE ZERO: | Preparedness: Before the emergency. | <ul style="list-style-type: none"> • Trainers are identified and trained. • The UNICEF education kits are strategically pre-positioned. |
| PHASE ONE: | Rapid Response: The first eight weeks from the onset of the emergency. Acute phase of the emergency. | <ul style="list-style-type: none"> • CFS/Es are identified and set-up according to the context. • Education kits are distributed. • Semi-structured recreational activities are implemented and are linked to non-formal education programmes. • Teachers, caregivers and instructors are recruited and trained. |
| PHASE TWO: | Early Recovery: Approximately between eight weeks and six months from the onset of the emergency. Acute phase of the emergency. | <ul style="list-style-type: none"> • Non-formal education is implemented while the national education system is rehabilitated. • The national curricula and the related textbooks in use before the emergency are recovered. • If it is not possible to recover the national curricula and the related textbooks, new national curricula are developed in collaboration with the Ministry of Education (MOE) or other Education Authorities. • Textbooks related to the new curricula are developed and printed. • In the case of refugees, links are established with the education curricula of the country of origin. |
| PHASE THREE: | Transition Phase: After approximately six to eight months from the onset of the emergency. | <ul style="list-style-type: none"> • Children resume formal schooling. • The formal curriculum is introduced. • Textbooks are distributed. |

References: Inter-Agency Standing Committee (IASC), 2006, ‘*Guidance Note on Using the Cluster Approach to Strengthen Humanitarian Response*’, Geneva.

UNICEF, 2010, ‘*Core Commitments for Children in Humanitarian Action*’, New York, p.3.

UNICEF, 2010, ‘*Emergency Field Handbook*’, New York, pp. 220 – 242.

• Types of Education provided by the EiE Non-Formal Curriculum

The EiE/C Non-Formal Curriculum provides different types of education according to the specific context and needs.

Formal Education refers to the national education system of a country implemented and managed by the Ministry of Education (MoE) or other Education Authorities. Formal education implies the existence of national curricula and related textbooks. UNICEF EiE/C Primary Mathematics Education (Module Five) and Primary Science Education (Module Six) are intended as an extra support to existing curricula and reference textbooks.

Non-Formal Education (NFE) targets specific disadvantaged groups who due to their circumstances need ad-hoc, tailored educational programmes. Alternative Learning Programmes (ALP) for Refugees and Internally Displaced People (IDPs) are an example of NFE. NFE programmes are not an alternative to formal education. Early Childhood Development Education (Module Three) and Basic Primary Education (Module Four) are also NFE programmes.

Informal Education is complementary to Formal and Non-Formal education programmes. Informal Education provides extra-curricular activities in informal settings, such as youth clubs or informal groups. Informal Education activities are not implemented during Formal or Non-Formal Education hours. Informal Education is not a substitute for Formal or Non-Formal Education. Recreational Activities (Module Two) provide Informal Education activities.

BOX 3: Types of Education provided by the UNICEF EiE/C Curriculum

| CURRICULUM AND KIT | TARGET GROUP | TYPE OF EDUCATION |
|---|--|---|
| Recreational Activities – Recreation Kit | Approximately 7/8 – 19 year-old children and adolescents | Informal Education complementary to Formal and Non-Formal education. |
| Early Childhood Education – ECD Kit | Approximately 0 – 6 year-old infants, toddlers and pre-school children | Non-formal Education |
| Basic Primary Education – School-in-a-Box (SIB) Kit | Approximately 7/8 – 19 year-old children and adolescents | Non-Formal Education for Beginners (B) and Non-beginners (N). |
| Primary Mathematics Education – PMK | Approximately 7/8 – 19 year-old children and adolescents | Formal Education |
| Primary Science Education – PSK | Approximately 7/8 – 19 year-old children and adolescents | Formal Education |

• **Deployment of the UNICEF Education Kits**

The deployment of the UNICEF education kits is in line with the different phases of the emergency. BOX 4 below provides an indicative overview of the deployment of the kits by phase.

BOX 4: Deployment of the Education Kits according to the Phase of the Emergency

| | | |
|--------------|------------------|---------------------------------|
| PHASE ONE: | Rapid Response | Recreation – Kit |
| | | Early Childhood Development Kit |
| PHASE TWO: | Early Recovery | Recreation Kit |
| | | Early Childhood Development Kit |
| | | School-In-a-Box Kit |
| PHASE THREE: | Transition Phase | Recreation Kit |
| | | Early Childhood Development Kit |
| | | School-In-a-Box Kit |
| | | Primary Mathematics Kit |
| | | Primary Science Kit |

• **Training related to the implementation of the Handbook**

The Handbook requires two sets of training:

- **Training of Trainers (TOT).** Trainers are trained on how to set-up and deliver the training to instructors, caregivers and teachers. Module One provides the training guidelines related to the EiE/C Curricula. Trainers are identified and trained on the Handbook during the preparedness phase.
- **Training of Instructors, Caregivers and Teachers.** Instructors, caregivers and teachers implementing the EiE/C Curricula should receive a pre-service training, which can be followed-up by an in-service training according to their specific needs and context. Instructors, caregivers and teachers are trained on the specific Module they are going to implement. Instructors will be trained on Module Two, caregivers will be trained on Module Three and teachers will be trained on Modules Four, Five or Six.

PRIMARY MATHEMATICS

LEARNING OUTCOMES



At the end of Module Five you will be able to:

1. Identify the contents of the UNICEF Primary Mathematics Kit
2. Demonstrate how to implement psychosocial activities
3. Demonstrate how to deliver primary mathematics lessons using the teaching aid of the UNICEF Primary Mathematics Kit

Welcome to Module Five of the **UNICEF Education in Emergencies (EiE) Handbook**. In this module you will learn to plan and deliver mathematics lessons using the materials of the UNICEF Primary Mathematics Kit (PMK) in a context of emergency or in a setting with limited educational resources.

You are about to play a major role in the life of many children who find themselves in difficult and new circumstances, either because they are living in conflict areas or because they have survived a natural disaster. Many of these children have experienced traumatic and distressing events that suddenly changed their lives. It is highly likely that you have experienced the same events.

This Module aims at providing practical guidelines and tools that can help you in your tasks. The Primary Mathematics Curriculum requires some teaching experience and knowledge of primary mathematics concepts. The UNICEF Primary Mathematics Kit (PMK) was designed to meet the needs of mathematics teaching activities in primary schools based on existing curricula and textbooks.

The success of the activities provided will be determined by your engagement with the families, the local community and authorities, your capacity to deal positively with that challenges you will be facing, and your dedication to the well-being of the children in your care.

You will be working closely with other teachers, and with parents, caregivers, community members, local authorities and other support staff, to facilitate the good management of the class. In addition, you will be collaborating with UNICEF personnel and/or with the Implementing Partners (IPs) appointed by UNICEF.

It is likely that many of the challenges you encounter will not be solved immediately—therefore, your patience, creativity and initiative will go a long way toward ensuring that your efforts are successful.

Please use the following guidelines in your best capacity and use your best judgment in applying them to your context. Thank you for your valuable contribution!

NOTE *IPs can be local Non-governmental Organizations (NGOs), Community-Based Organizations (CBOs) and/or representatives of the local education authorities that collaborate with UNICEF in the implementation of the primary education interventions.*

NOTE *UNICEF personnel can be part of the education, protection and water and sanitation (WASH) and shelter programs.*

NOTE *This module is part of the UNICEF EiE Handbook and requires your participation in a teachers' training workshop.*

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UNIT ONE:

DESCRIPTION OF THE TEACHING AIDS OF THE PRIMARY MATHEMATICS EDUCATION KIT (PMK)



LEARNING OUTCOMES



At the end of **Unit One** you will be able to:

1. Identify the teaching aids contained in the UNICEF Primary Mathematics Kit
2. Explain how to store and restock the UNICEF Primary Mathematics Kit

In this Unit you will learn to identify the different teaching aids contained in the UNICEF Primary Mathematics Kit. Some of these materials may be new to you—therefore, it is very important that you take the necessary time to familiarize yourself with them.



YOUR ROLE is to familiarize yourself with the items contained in the UNICEF Recreation Kit, and understand how to use them in the implementation of the activities.

The **objective** of Unit One is to provide an overview of the teaching items contained in the UNICEF Primary Mathematics Kit.



ACTIVITY ONE:

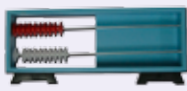





What teaching aids can I find in the UNICEF Primary Mathematics Kit?



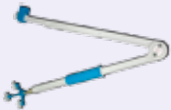




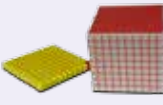

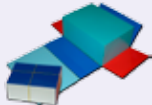

NOTE It is possible that some of the items listed in **Table 1** are not the same as the ones you received in the box. Your task is to familiarize yourself with the teaching aids and record them, so that you can keep track of the materials and restock if necessary.

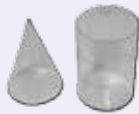
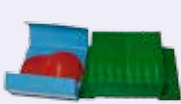

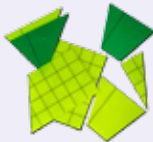


The following table provides a list of the materials contained in the UNICEF PMK. It includes a picture, the quantity, and a short description of each of the materials. Read it carefully and check to ensure that all of the materials are present in the box you received. Take the time to count each item and familiarize yourself with the contents.

TABLE 1: List of the materials contained in the UNICEF Primary Mathematics KIT (PMK)



| # | ITEMS | PICTURE | QUANTITY in each box | DESCRIPTION AND USE |
|----------------------------------|--------------------|---|-------------------------------|--|
| ARITHMETICS TEACHING AIDS | | | | |
| 1. | Horizontal abacus |  | 1 item | 1 item composed of 2 rows with 10 beads of different color in each row. Use: To learn arithmetic operations between 1 and 20. |
| 2. | Vertical abacus |  | 1 item | 1 item composed of 5 columns with 10 beads of alternate color in each column. Use: To learn arithmetic operations between 1 and 50 and up to 10,000. |
| 3. | Oral practice unit |  | 1 set of 64 'character cards' | 4 sets of 'character cards', each with 16 cards. Use: To learn arithmetic operations: additions, subtractions, multiplications and divisions. |
| 4. | Counting rods |  | 1 set of 100 rods | 1 plastic set of 100 rods in 5 color groups, each of 20 rods. Use: To learn arithmetic operations up to 100. |
| 5. | Fractions set |  | 1 item | 1 set composed of 5 items: <ul style="list-style-type: none"> • 2 pieces of 1/2 circle • 3 pieces of 1/3 circle • 4 pieces of 1/4 circle • 5 pieces of 1/5 circle • 6 pieces of 1/6 circle Each set can form a same size circle of 20 cm diameter. The item also includes 5 circular plastic films, representing the following equal divisions of a circle: <ul style="list-style-type: none"> • 2 equal divisions • 4 equal divisions • 6 equal divisions • 8 equal divisions • 12 equal divisions Each piece is magnetic and can be used on steel blackboard. Use: To learn about partial fractions. The whole (in this case the circle) is partitioned into equal fractions (parts). |
| 6. | Clock |  | 1 item | 1 clock. Use: To learn to tell the time according to the 24 hour international convention. NOTE You can adapt the learning of the time according to your local context and culture. The clock can also be used to learn fractions. 1 day is divided into 24 hours; each hour is divided into 60 minutes. |

| BLACKBOARD GEOMETRY TEACHING AIDS | | | | |
|-----------------------------------|--|---|--|---|
| 7. | Protractor |  | 1 item | Protractor of 180 and 440 mm base with detachable handle. Use: To measure angles in degrees and to draw angles. |
| 8. | Square sets |  | 2 items | 1 square set for 30-60-90 angles and 1 square set for 45-45-90 angles with detachable handle. Use: To draw lines and angles and to measure angles. |
| 9. | Compass |  | 1 item | 1 compass with an interchangeable suction foot to ensure stability on the surface, and a soft plastic point with a metal butterfly screw for adjusting tightness. Use: To draw a circle or a curve. |
| GEOMETRY TEACHING AIDS | | | | |
| 10. | Geometry – Set |  | 5 items | 5 plastic pieces: <ul style="list-style-type: none"> • 1 cylinder of 60 mm diameter and 100 mm height; • 1 hollow cylinder of 60 mm inner diameter, 100 mm outer diameter and 100 mm height; • 1 cube of 100 mm × 100 mm × 100 mm; • 1 cuboid of 60 mm × 100 mm × 140 mm; • 1 cone of 60 mm base diameter and 102 mm height Use: To demonstrate geometry figures. |
| 11. | Angle Demonstrator |  | 1 item | One 0° to 360° foldable aluminium disk of 2 cm diameter. Use: To demonstrate the different types of angles. |
| 12. | Geographic board |  | 1 item | 1 geographic board of 33.5 cm × 53.5 cm. It is printed with 187 grids 3 cm × 3 cm each in alternated colors. Copper pins are nailed on each crossing point of the grids. Use: To learn different geometric figures using a rubber band. |
| 13. | Cubes |  | 1 plastic item composed of 1000 detachable cubes | The volume of each cube is 1 cubic cm. All 1000 cubes can form 1 cube. There are 5 different colors, with 200 cubes in each color. Use: To learn calculation, measuring, sorting and probability. |
| 14. | Cube – Volume Demonstrator |  | 1 plastic item composed of 4 detachable parts | 1 cube volume demonstrator of 4 parts: <ul style="list-style-type: none"> • 1 part of 10 mm × 10 mm × 10 mm • 1 part of 90 mm × 10 mm × 10 mm • 1 part of 90 mm × 100 mm × 10 mm • 1 part of 100 mm × 100 mm × 90 mm Use: To learn how to calculate the volume of cubes and cuboids. |
| 15. | Cube – Capacity Unit Demonstrator |  | 2 items | 1 transparent plastic box with the capacity of 1000 ml and 1 plastic cube with the volume of 1dm ³ . The box can contain 1dm ³ . Use: To learn how to calculate the capacity of cubes and cuboids. |
| 16. | Cuboid and Rectangle – Area and Perimeter Demonstrator |  | 1 item composed of 1 cuboid and 6 pieces | 1 plastic cuboid of 140 mm × 100 mm × 60 mm; and 6 plastic pieces demonstrating the surface area of the same sized cuboid. Use: To learn how to calculate the area and perimeter of cuboids and rectangles. |
| 17. | Circle – Area and Diameter Demonstrator |  | 1 item | 1 plastic demonstrator board of 48 cm × 25 cm. It consists of 17 sectors: 15 sectors that are equal to 1/16 of the cylinder volume; and 2 sectors that are equal to 1/32 of the cylinder volume. Use: To learn how to measure the area and diameter of circles. |

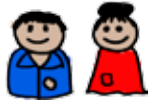
| | | | | |
|----------------------------|--|---|---|---|
| 18. | Cone and Cylinder – Volume Set |  | 2 items | 1 transparent plastic cylinder and 1 transparent plastic cone. The cylinder and the cone share the same circle area of 100 mm diameter and the same height of 150 mm. Use: To learn how to calculate the volume of cones and cylinders. |
| 19. | Cylinder – Volume and Surface area Demonstrator |  | 1 item composed of 1 flank and 2 bases | 1 cylinder volume demonstrator made of rigid plastic of 15 cm high and 10 cm diameter composed of <ul style="list-style-type: none"> • 1 expanded flank of the cylinder • 2 bases cylinder of the cylinder The demonstrator is divided into 2 equal parts. Each of the 2 parts consists of 17 sectors: 15 sectors that are equal to 1/16 of the cylinder volume; and 2 sectors that are equal to 1/32 of the cylinder volume. The 2 equal parts can also form an approximate cuboid. Use: To learn how to calculate the volume and surface of cylinders. |
| 20. | Geometry figure making cards |  | 1 item composed of 4 pieces of cards 388 mm x 270 mm each | Each card is composed of 4 expanded pictures: 1 picture of an expanded cube , 1 of a cuboid , 1 of a cylinder , and 1 of a cone . Use: To learn how to make and identify the different parts of cubes, cuboids, cylinders and cones. |
| 21. | Geometry figures set |  | 1 set composed of 7 plastic pieces of different shapes | Geometry figures: <ul style="list-style-type: none"> • 1 cuboid The right-angled triangle and right-angled trapezium can form a cuboid • 1 right-angled triangle: right angle sides of 133 mm x 66 mm and hypotenuse of 148 mm • Two 45°-65°-70° triangles with altitude line printed on the surface • 1 right-angled trapezoids of 133 mm upper side, 199 mm lower side, 133 mm height and 148 mm hypotenuse • Two 70°-75°-105°-110° trapezoids base side 143 mm, upper side 62 mm, other sides 223 mm, and 290 mm with altitude line printed on the surface Use: To learn how to identify cuboids, different triangles and trapezoids. |
| TEACHER'S MATERIALS | | | | |
| 22. | UNICEF EiE Handbook: Module Five Primary Mathematics |  | 1 booklet | 1 booklet. Use: UNICEF EiE Handbook Module Five: Primary Mathematics. You are expected to use Module Five in the planning and delivery of the Primary Mathematics Curriculum and adapt it to the local culture and context. |
| 23. | Portable storage box |  | 1 lockable metal box | The metal box is provided with 2 padlocks. Use: To store and carry the Primary Mathematics teaching aids. |

NOTE Not all PMK Kits come in a metal box; occasionally PMK materials are contained in a carton box.

NOTE Storage and transport of the Primary Mathematics box can be shared among the volunteers and the students.

● **Storage of the UNICEF Primary Mathematics Kit**

The metal box is designed to store the PMK Kit materials safely. If the Child-Friendly Space/Environment (CFS/E) or school is based in a tent or is a temporary learning space, it is recommended to carry the box with the contents to a safe place nearby when activities are over. Sometimes teachers do not use the PMK Kit teaching aids for fear of spoiling the new items and prefer to keep them in the head teacher’s office or in the store. UNICEF Primary Mathematics teaching aids are intended to stimulate learning processes—therefore, they are expected to be available to students at all times.



YOUR ROLE is to make sure that the PMK materials are used in the education and psychosocial activities regularly, that they are available to all children, and that they are not lost, stolen or intentionally damaged.

NOTE Remember *NOT* to leave the box and the teaching aids outdoors, as rain, high temperatures and dew can cause damage.



THINK: Did you familiarize yourself with all the items of the UNICEF Primary Mathematics Kit? Are there any teaching aids that you are not sure how to use in the learning activities? Discuss it with your colleagues and/or UNICEF staff or Implementing Partners (IPs).

• Maintenance of the Primary Mathematics Kit materials

Primary Mathematics teaching aids must be properly maintained to ensure safe and long use. To prolong the lifespan of the Primary Mathematics teaching aids, make it a routine to check the items and keep a record of them. If something is missing, ask the students if they know where the items are located. Sometimes it is easy to misplace things, especially if you are in a hurry to tidy up the place. Make it a routine to ask students to return the teaching aids to the box after use. You can appoint 1 or 2 students as managers of the teaching aids. They can help you to ensure that all the teaching aids are returned and properly stored in the portable box after use.

UNIT TWO:

PSYCHOSOCIAL ACTIVITIES



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LEARNING OUTCOMES



At the end of Unit Two you and your students will be able to:

1. Use art and play to establish safety, build community and interact with each other
2. Feel safe to play and express thoughts, feelings, and memories
3. Understand how to positively support learning during an emergency

NOTE Unit Two is complementary to Unit Three. Its objective is to provide some extra support to students who have survived distressing events.



NOTE Some children may require more specialized support than can be provided in a psychosocial activities group. If you notice that a child is severely withdrawn and separate from his/her peers, has rapid mood changes, or behaves very aggressively, this child might be depressed or severely distressed and should be referred for specialized counseling and care. More detailed guidelines on psychosocial activities are provided during the UNICEF EIE Handbook training.

Psychosocial well-being is about the child's feelings, thoughts and perceptions, as well as his/her positive relationships and connections with individuals in his/her family, school or Child-Friendly Space/Environment (CFS/E), and community. These connections provide support and help the child to feel safe, healthy, protected, respected, heard, and happy. In emergencies and conflict situations, psychosocial support helps children to adjust to changes in their lives. It can help rebuild their confidence, sense of belonging, self-esteem and hopefulness about the future. Psychosocial activities also promote relaxation and better concentration during classes. Psychosocial activities are complementary to mathematics activities.

YOUR ROLE is to focus on being especially patient and understanding with the students. Their reactions to the emergency are out of their control, and their silence or anger is a way of trying to cope with their distress. Practice regular relaxation exercises at the beginning of the class.

NOTE Be aware of gender dynamics and adjust the way you handle the division of children into learning-groups to your context and culture.

The **objective** of Unit Two is to provide guidance on how to conduct simple and practical psychosocial support activities.



THINK: Do you remember what it was like for you to play as a child? What helped you to feel stronger and happier? When working with children, it is beneficial for you to also participate in the group activities. You are encouraged to be humorous and playful in your interactions with the students.



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Checklist 1: Involving parents and guardians

- **Get to know the parents/guardians of the students.**
- When speaking to parents/guardians focus on the strengths and **positive qualities** of the child.
- Encourage parents/guardians to **continue supporting their child's play and expression** at home. Explain that it is normal for the child to display changes in behavior after a stressful event. Children might experience difficulties sleeping, have bad dreams, become more attached to the parent/guardian, or reject them and display anger.
- Encourage parents/guardians **to be supportive** by showing understanding and patience, **listen to their child's concerns and confusion**, allow them to cry and feel sad, and take time to explain why there are changes in their lives and what to expect next.
- You can also invite the parents to a meeting or workshop where you teach them relaxation exercises and discuss as a group how to help their children at home. The parents/guardians will also have experienced the emergency and will benefit from parent/guardian psychosocial activities too. Consider activities like inviting them to trace and decorate a hand and make a Circle of Parents/Guardians' Hands.
- Speak to parents/guardians about **the importance of routines and customs** at home.



THINK: What are other ways you can include parents in psychosocial support? How can you and your colleagues also provide psychosocial support for each other?

It is advisable to integrate the following psychosocial activities into the Primary Mathematics Curriculum. These activities contribute to building safety, trust and teamwork in the class; they promote free expression, and support learning processes. They also support relaxation, and enhance the capacity to concentrate during classes.

Psychosocial activities should be implemented according to age-groups: **7 to 14 year old** children and young adolescents and **15 to 18 year old** adolescents.



ACTIVITY ONE: Art and Craft (A&C) Psychosocial Activities

NOTE The Primary Mathematics Kit does not provide art and craft materials. It may be possible for you to purchase basic materials locally with the support of the Implementing Partners (IPs) or the UNICEF team.

| ART AND CRAFT (A&C) PSYCHOSOCIAL ACTIVITIES | | |
|---|--------------------------------|--------------------------------|
| # | Activity | Age-groups |
| 1. | Our Circle of Hands | 7 - 14 years and 15 - 18 years |
| 2. | Drawing with Themes | 7 - 14 years and 15 - 18 years |
| 3. | Helping Hands | 7 - 14 years and 15 - 18 years |
| 4. | Classroom Container of Worries | 7 - 14 years and 15 - 18 years |

A&C – Psychosocial Activity One: Our Circle of Hands

Ages: 7 to 14 years and 15 to 18 years.

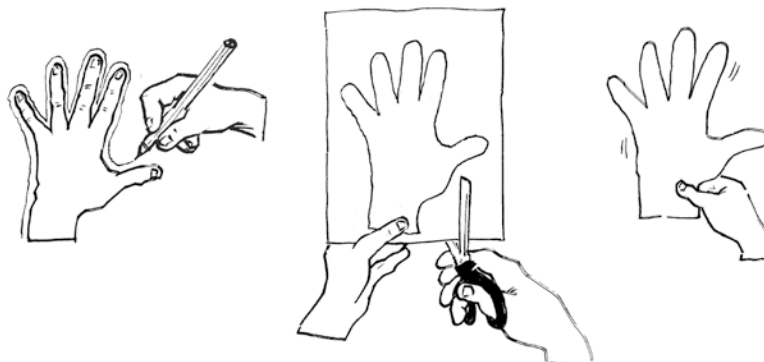
Psychosocial Objective: To build community, belonging, safety, and connection among children and teachers. It also can be used as an ongoing ritual for including new students in the class.

Materials: White drawing paper, crayons, colored pencils, painting colors—such as watercolors or acrylics, scissors, glue and tape, according to what is available in your context.

NOTE Use plastic sheeting or tarpaulin (if available) to sit on during activities, because this helps to define the group's safe area

Preparation: Before the students arrive to class trace the outline of your hand on a piece of white drawing paper. Use scissors to cut the drawing of the hand out of the paper so you have a life-sized paper hand. Use this as an example when explaining the activity to the students. Prepare a space for the class to sit in a circle together.

FIGURE 1: PRE-CUT HANDS



NOTE Use plastic sheeting or tarpaulin (if available) to sit on during activities, because this helps to define the group's safe area.

STEP 1: Invite the children to sit in a circle on the floor. Sit on the floor with them.

STEP 2: With excitement and positivity, explain that you are interested in getting to know the children as individuals and as a group.

STEP 3: Acknowledge that you know that they have been through a difficult, frightening and confusing event(s) and that there are changes in their lives at home and in their community.

STEP 4: Explain that this is a safe space where they can feel free to play, have fun, ask questions, make friends and be supported by adults and peers.

STEP 5: Explain that to begin to get to know each other we are going to make something together using our hands.

STEP 6: Using your paper hand as an example, ask each student to first trace the outline of his/her hand on the paper. Explain that they will next decorate it, and then cut out the decorated hand outline.

NOTE Always encourage the children to share and use as many colors as they want while drawing.

STEP 7: Once every child has a hand outline, invite them to decorate their hands any way they want. They can write their names, draw symbols, lines, fill the hands with color, etc. It is each student's own unique hand and a way to introduce himself/herself to the class. Give the group 30-40 minutes to finish their hands.

STEP 8: After decorating the hands, ask them to use scissors to cut out their hand outlines.

NOTE Make sure that the hand cut outs overlap and are connected.

STEP 9: Once finished, begin the next step by sitting back in a circle. Say your name out loud while placing your decorated hand on the floor in front of you towards the center of the circle. Ask the child next to you to introduce his/her name by saying out loud, "My name is ____," while placing his/her paper hand next to yours. Go around the circle with every child and teacher saying their names while connecting their paper hands to the circle of hands that is forming.

NOTE It is important that you take care of the circle of hands, because it is now a symbol of connection, safety, community, empathy, and trust for the children.

STEP 10: Once everyone has introduced their names, there should be a circle of connected paper hands. Ask the children: *How does it feel to see all of our hands connected?*

STEP 11: Briefly explain. We all use our hands to greet each other and help each other. *In what other ways to we use our hands?* Discuss with the students.

NOTE If a new child later joins the class, ask him/her to follow the above steps and create his/her own hand outline to decorate with his/her name, symbol, or design. To introduce the new child, ask all the children to sit in a circle around the circle of hands they created the first week and take turns introducing their names to the new child. Next, invite the new child to introduce his/her name while connecting his/her decorated hand to the circle of hands. Make sure to glue his/her hand to the Circle of Hands.

STEP 12: Use the glue or tape to permanently connect the hands together. The circle can be used to decorate the learning environment.

Message to convey to the children: Like the circle of hands, we are all connected. We can use our hands to show care and kindness, and to give and receive help from others.

A&C – Psychosocial Activity Two: Drawing With Themes and Directions

Ages: 7 to 14 years and 15 to 18 years

Psychosocial Objective: Using themes and directions for drawings is a way of encouraging the students to recognize their individual community strengths, stories of survival, and positive interactions.

Materials: White drawing paper, crayons, colored pencils and painting colors, such as watercolors or acrylics, according to what is available in your context.

Preparation: Review Checklist 2 below, 'How to positively interact and

talk to students about their artwork'. Choose a theme for the students to draw that will encourage them to recognize their individual and community strengths, stories of survival, and positive interactions. Spend a few minutes first exploring the theme and asking questions that encourage their imagination and ideas. Give the students 30-40 minutes for their drawings. Bring the drawings together in a circle or display on the wall, and then facilitate a class reflection and story sharing about the drawings.

Examples of Themes for the children’s drawings:

- Myself as really strong. Include what helps me to stay strong. *Example: food, family, friends.*
- My favorite thing about myself. *Example: I am really good at dancing/ playing football/singing.*
- My favorite thing about someone I like/love.
- My favorite game/animal/friend/food.
- Someone or something that helped me.
- How I can help someone. *Example: I can hold my friend’s hand when she is sad.*
- Draw a line in the middle of the paper. On one side draw a picture of a sad memory or experience. On the other side draw a picture of a happy memory or experience.
- My favorite place. *What does my favorite place look like? How do I feel when I am there?*
- A place where I feel safe. *How does the place where I feel safe smell? What is the weather there like? What sounds do I hear when I’m there? What do I see? Who or what is with me? Where is the safe place located?*
- Draw a picture to a student somewhere else in the world who is also going through a difficult time in his/her life because of an emergency. *What advice or support can I give to that child? What helped me through the most difficult day? Are there any people, words or actions that helped me to feel better?*
- What my life was like before and after an emergency event. Fold a piece of paper in half and label column 1 “Before” and column 2 “After”. Make a list using words or drawings of the way things were before the event. Then, fill out the other side with the way things have been after the event. The “After” list may be long and sad. Help the students think of positive outcomes from the event, such as people helping each other, and making new friends. This helps the students to process the event and realize what they still have.

NOTE It can be a real or imagined space. If students have difficulty identifying a safe space, the teacher can help them think of qualities they would like to have in a safe space to help trigger their imaginations.

NOTE The teacher should emphasize that the children are survivors and have important advice to share with the world about their experiences.

NOTE The teacher should also encourage the students to be aware of what things stayed the same.

NOTE As a student shares a story about his/her drawing or speaks to you, be aware of the expression on his/her face and body language, and then help him/her find the words to describe the feeling experienced. Hold group conversations about emotions and encourage the students to ask questions and give advice to their peers. For example: “When do you feel sad? What does it feel like? What helps you to feel happy?”

A&C – Psychosocial Activity Three: Helping Hands

Ages: 7 to 14 years and 15 to 18 years

Psychosocial Objective: This activity invites children to explore and reflect how they can make a positive difference during a difficult and painful time. It encourages them to see that they are playing an active

role in helping their family and community. Through the activity they will see how they have been helped and how they can help others.

Materials: Paper, crayons, colored pencils and painting colors, such as watercolors or acrylics, according to what is available in your context.

Preparation: Each student will need 2 pieces of paper. Ask students to think of examples of how they have both received and given help to others during the emergency.

STEP 1: Begin by briefly discussing with the children how everyone needs and offers helping hands to one another, especially in troubled times. Ask the students: *Can you give an example of how you received or offered a 'helping hand' to someone?*

STEP 2: Invite the students to draw the outline of 1 of their hands.

STEP 3: Explain: Inside each finger of your hand you can use symbols, drawings or words to represent the name of a person, thing, or organization that has helped you through the crisis. Each finger represents 1 example.

STEP 4: Next, invite the students to make a 2nd helping hand outline. Inside each finger, have the children draw or write 5 ways that they have helped or will help others.

NOTE If no materials are available, the children can be placed in pairs or in smaller groups and can take turns using their hands and fingers to describe the help they have received and given to others.

A&C – Psychosocial Activity Four: Classroom Container of Worries

Ages: 7 to 14 years and 15 to 18 years

Psychosocial Objective: Children in emergencies have worries that may have solutions, as well as bigger worries that are not easily resolved. This activity helps children identify things that are troubling them, while also encouraging and providing them a way to remember what to do to feel better.



YOUR ROLE is to provide a safe container for their worries. It helps the children to know that their worries and fears are being heard and acknowledged, and that an adult they trust is holding their worries for them.

NOTE Ideally, use a container that can be closed and kept permanently in the learning environment to be returned to on a weekly basis.

Materials: Colored or white paper, scissors, pens, pencils, and a container like a small box or bag.

Preparation: Cut the colored paper into smaller pieces.

NOTE Keep the pieces just large enough for the children to have space to draw or write with pencils and pens.

STEP 1: Begin a discussion with the children about sharing things that they are worried about. You can start the conversation by giving an example of a less severe worry, like being late for school. Ask the class: *If you are worried about being late for school, what can you do to solve the problem?* For example: I can wake up a bit earlier in order to have more time, or I can talk with my teacher and explain why I am late.

STEP 2: Ask the children to draw the problem on 1 side of the paper, and the solution on the other side.

NOTE Do not force students to tell their worries to the rest of the class. If they prefer, they can simply draw their worries and solutions and put them in the container.

STEP 3: Before each child puts their worry inside the container, discuss their worry and solution as a group. Explain: Some worries are bigger

than others and not easily solved, but the container can take the worry away from you and do the worrying for you.

STEP 4: Take the container you have, and as you put the paper with the worry inside the container, explain to the group that the worry and solution is now going to be kept safe inside the *Class Worry Container*. Have the class choose where in the learning environment to keep the **Worry Container** for safekeeping.

STEP 5: Repeat this activity once a week. Students can add a worry/solution to the class container. They can also choose to take past worries out of the container.

NOTE *Serious issues may come up as children express their worries that might need adult intervention (e.g., protection or health issues). Also, while children are expressing their worries it may appear that some children may need further psychosocial counseling and care. It is important to report these issues and ensure that they are dealt with. Be tactful.*

Message to convey to the children: It is normal to have difficult thoughts, feelings and emotions, and it is important to be able to express them and think of solutions to feel better. Your worries and solutions are being heard and are being kept safe by an adult. Let them know that every week they can add a worry/solution to the class container—or whenever needed, as some might have urgent worries that arise. The children can also choose to take past worries out of the container.



Checklist 2: Tips on how to positively interact and talk to children about their drawings

- Discuss and establish **ground rules** about how to feel safe and respected. Include the students’ ideas. This list can be displayed in the class. The list does not necessarily have to be written. Alternatively, it could be drawn or a collection of items can be used as symbols/reminders of these agreements. Possible agreements: Be nice to each other; Ask permission before drawing on someone else’s paper; Respect each other’s artwork and ideas; Listen when someone else is speaking; Help clean-up our work space after the activity is finished.
- Explain to the children that **there is no right or wrong way to draw** during art activities. (For example: It is acceptable for a child to draw a green sky, a blue tree, or a person with purple skin).
- **Do not correct a student’s drawing.** Accept and validate in your speech and actions his/her drawings and expression.
- **Do not assume that a child is done with his/her artwork.** Ask if he/she is finished. If needed, you can offer extra time or the opportunity to finish another day.
- **Listen without judgment.**
- **Do not pressure students to share or talk about their artwork.** Trust that the student will share when ready. Be patient. The more comfortable and safe the student feels, the greater the likelihood that he/she will express feelings.
- First ask **closed questions** about the artwork. This gives the children the opportunity to control when to share. For example: start by asking: “Is there a story about your drawing that you want to share?” If they say “Yes”, then you can begin asking more open questions about the details of the drawing and story.
- Give children the **opportunity** to focus on survival, courage, endurance, compassion, hope, joy, wishes, dreams and strengths in relation to their drawing.

- **Acknowledge expression of both negative and positive emotions.**
- It can be intimidating and overwhelming for students to share their stories with a large group. If more than 1 teacher is available, the students can be organized into **smaller groups** when discussing their drawings and stories.
- **Respect and take care of the artwork.** Keep it as clean and as protected as possible.
- Encourage children to **feel proud** of their artwork and write their names on the back of their drawings.
- **Display the artwork in class** by taping it on the walls or learning environment, BUT first ask the children for permission to display it.



ACTIVITY TWO: Play, Relax and Assurance (Pra) Psychosocial Activities

PLAY, RELAX AND ASSURANCE PSYCHOSOCIAL ACTIVITIES

| # | Activity | Age-groups |
|---|--------------------------------------|--------------------------------|
| 1 | Web of Connections | 7 - 14 years and 15 - 18 years |
| 2 | Exercises to Relax, Calm and Comfort | 7 - 14 years and 15 - 18 years |
| 3 | Rituals and Routines | 7 - 14 years and 15 - 18 years |

PRA – Psychosocial Activity One: Web of Connections

Ages: 7 to 14 years and 15 to 18 years

Psychosocial Objective: Distressing experiences can cause students to feel uncomfortable or trapped in their bodies. They may also find it difficult to interact with people and their environment. This activity frees and loosens the energy in the learning environment, and helps promote the connection between students and teachers. It also provides an opportunity to learn and remember names.

Materials: A ball or a soft object that can be tossed or rolled, and space to sit or stand as a group.

STEP 1: Sit or stand together in a circle. Include yourself and any other teachers present.

STEP 2: While holding the ball say your name out loud. Then toss the ball to any student in the circle while saying his/her name out loud.

STEP 3: That student will then repeat his/her name while holding the ball. The student will next toss or roll it to another student while saying the other student’s name out loud. Repeat this until every student has caught the ball—with each student only receiving the ball once—until the ball has been returned to you.

STEP 4: Do the exercise again—in the same order. Ask the students to try to repeat the pattern; to try to move the ball from student to student

in the same order, while saying the names out loud.

STEP 5: Repeat the exercise a few more times, staying with the pattern. You can also add emotions or feelings to the ball, such as it is a slow, fast, hot, cold, sad, happy ball.

PRA – Psychosocial Activity Two: Exercises to Relax, Calm and Comfort

Ages: 7 to 14 years and 15 to 18 years

Psychosocial Objective: To facilitate and encourage students to feel present in their bodies and learn activities that will help them to feel relaxed, calm and comforted. You can teach students to use these techniques when they feel scared, anxious, sad, angry, or worried. Teach 1 of these exercises to the students each week, and **use at least 1 relaxation exercise every day.** They can be used before an art activity or when you notice that the students need to lower their energy or anxiety levels. You and the students can also choose 1 relaxation activity with which to end the day as a comforting ritual and to help them go home relaxed.

Materials: Open space within which to lie down or stand as a group. It can be done indoors or outdoors. If available, use plastic sheeting, a tarpaulin, or mats when lying on the floor.

Preparation: Try to practice each of these exercises before teaching them to the children.

Exercise A: Deep Breaths

STEP 1: Teach students how to become aware of their breath and to breathe deeply while also using their imaginations. You can use this quick deep breathing exercise daily.

STEP 2: While sitting or standing, ask each student to make a fist with his/her right hand and imagine it is holding a sweet smelling flower, fruit, or favorite food.

STEP 3: Next ask each student to make a fist with his/her left hand and pretend it is holding a candle or fire.

STEP 4: Direct the students to inhale deeply the smell of the flower/fruit/food in their left hands and then blow out the candle and fire in their right hands. Continue deeply breathing in the sweet smell through the nose and breathing out the fire from the mouth. Repeat the cycle of breathing in and out at least 3 times.

Exercise B: Butterfly Hugs

STEP 1: Cross your arms across your chest as if you were holding yourself, so your left hand is on your right shoulder and right hand on your left shoulder. Ask the students to imitate you.

STEP 2: Keeping your arms crossed alternately tap your hand on the shoulder it is touching: tap the left hand on the right shoulder, then tap the right hand on the left shoulder, and then continue to repeat the 2 alternating motions. Tapping one side at a time is the most important part of the exercise.

NOTE Do not force students to tell their worries to the rest of the class. If they prefer, they can simply draw their worries and solutions and put them in the container.



THINK: It is a good idea to try the exercises out with your colleagues, and discuss how best to implement them with the students. Do these exercises help when feeling stress or anxiety? Why? What else can you do to support the students in your context?

Step 3: You can tell the students that the tapping of their hands is like the wings of a butterfly or bird moving up and down. One wing moves up and comes down, and then the other wing moves up and comes down. Ask the students to do the exercise for 1 minute, stop, take a breath, and notice how they are feeling. Ask the students: *How do you feel?*

Step 4: Continue to do the exercise. You can do it for as much or as little time as you and the students find comfortable, and as many times a day as needed.

Exercise C: Belly Breathing

NOTE You can also do this exercise standing.

STEP 1: Have the students lie on their backs and put their hands on their stomachs.

STEP 2: Direct the students to take a slow deep breath in through the nose and let it out through the mouth with a gentle “a-h-h-h-h-h” sound. Tell them they should feel and see the hand on the stomach move up and down as they breathe in and out. Direct them to breathe in slowly through the nose and out through the mouth like they are trying to move a feather up in the air.

STEP 3: Breathe in slowly to the count 2, 3, 4, and out 2, 3, and 4. Repeat several times.

STEP 4: Ask the students how the exercise makes them feel. Practice the technique with them regularly. Talk to them about when to use it—for example, when they feel worried, angry or frightened. Encourage them to use this technique at home when going to sleep.

Exercise E: Laughter

NOTE Students and adults of any age can benefit from these relaxation activities. Use these techniques for yourself when you are feeling stressed or overwhelmed. You can also teach the skills to a child’s parent or guardian and encourage using them at home to release anxiety and stress.

Laughter is a way that students can naturally release stress, and relax. Think of games or ways to make students laugh. For example, sit or stand in a circle with the students and have them take turns trying to make each other laugh by making funny sounds or expressions with their faces and bodies or telling each other funny stories. Discuss with the students what makes them laugh.

PRA – Psychosocial Activity Three: Rituals and Routines

Ages: 7 to 14 years and 15 to 18 years

Psychosocial Objective: During emergency and conflict situations, the familiar rituals and routines of children at home and in school are disrupted. It is important to introduce the structure of rituals and routines into their learning environment. The more predictable their day, the safer and more protected the children will feel. Help them to identify rituals or routines in their day at school or at home. Ask them to think of old and new rituals, customs, and routines that are meaningful, enjoyable and important to them.

Examples:

- Ask the students to decide on a ritual to begin and end the day at school. It can be a special song or game they sing or play together at

the start of the day, and a relaxation activity before they go home.

- Students are full of energy and might find it difficult to focus on an art activity or class lesson. Start a new 2-minute ritual to release energy before doing a sitting activity or lesson. This could be dancing in a circle, stretching their arms towards the sky, tensing and releasing muscles, passing or rolling a ball to each other, or any other culturally relevant games. End the 1-2 minutes of physical activity with the students taking two deep breaths all together. By doing this you will help the students to release energy, as well as calm their bodies. Next, ask them to sit while you explain the art activity or lesson. This routine sequence of activities is a way of providing comfort and an understanding of the learning environment.
- Speak to parents/guardians about the importance of routines at home.
- Have discussions with the children about rituals and routines at home that make them feel happy or safe. Ask the students: *What time do you go to sleep? What are your morning or bedtime rituals and routines?*



THINK: *What are other rituals and routines you can implement in the learning environment?*



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UNIT THREE:

PRIMARY MATHEMATICS CURRICULUM



LEARNING OUTCOMES



At the end of Unit Three you and will be able to:

1. Demonstrate how to deliver mathematics lessons using the Primary Mathematics teaching aids
2. Know the overview of a standard Primary Mathematics Curriculum
3. Understand the Minimum Learning Achievements (MLAs) in basic numeracy

Unit Three provides 3 useful tools to guide you in the delivery of mathematics lessons: **(1)** a general overview of a standard Primary Mathematics Curriculum; **(2)** the Minimum Learning Achievements (MLAs) of basic numeracy; **(3)** the learning activities that can be implemented using the teaching tools of the Primary Mathematics Kit.

The **objective** of Unit Three is to provide practical guidelines for the delivery of Primary Mathematics lessons using the teaching aids of the UNICEF Primary Mathematics Kit



ACTIVITY ONE: Overview of a standard Primary Mathematics Curriculum

The following table provides an overview of the competencies of a standard Primary Mathematics Curriculum that you can use as a reference. Use the teaching aids in the best of your capacity to stimulate investigative learning and evidence-based understanding of mathematical concepts.



YOUR ROLE is to use the teaching aids to support the understanding of mathematical concepts.

TABLE 2: Overview of a Standard Primary Mathematics Curriculum



| STANDARD PRIMARY MATHEMATICS CURRICULUM |
|--|
| <p>NUMBERS AND THE NUMBER SYSTEM</p> <ul style="list-style-type: none"> • Read and write whole numbers; know what each digit in a number represents; partition numbers into thousands, hundreds, tens and ones. • Add or subtract 1, 10, 100 or 1000 to/from whole numbers; count on or back in tens, hundreds or thousands from any whole number up to 10,000. • Multiply and divide whole numbers, then decimals, by 10, 100, or 1000. • Use the vocabulary of comparing and ordering numbers: bigger than, smaller than, and equal to; use the symbols: $>$, $<$, $=$. • Round whole numbers to the nearest 10, 100, or 1000. • Recognize odd and even numbers, and make general statements about them. • Recognize multiples, and know some tests of divisibility. • Use fraction notation and recognize the equivalence between fractions; find fractions of numbers or quantities. • Use decimal notation; know what each digit in a decimal fraction represents; place a set of decimal fractions in its proper order. • Understand percentage as the number of parts in every 100; recognize the equivalence between percentages and fractions and decimals; find simple percentages of numbers or quantities. |
| <p>MEASURES</p> <ul style="list-style-type: none"> • Use vocabulary related to measures. • Suggest suitable units to estimate or measure length, mass or capacity. • Suggest suitable measuring equipment; record estimates and readings from scales to a suitable degree of accuracy. • Measure and calculate the perimeter, area, volume and capacity of simple shapes. • Use the vocabulary related to time; suggest suitable units of time to estimate or measure. • Read the time from clocks, calendars and timetables. |
| <p>SHAPES AND SPACE</p> <ul style="list-style-type: none"> • Describe and visualize 3-D and 2-D shapes; classify them according to their properties. • Make shapes and patterns with increasing accuracy. • Recognize reflective symmetry in 2-D shapes, reflections and translations. • Recognize positions and directions; use co-ordinates. • Make turns; estimate, draw and measure angles; recognize rotations. |
| <p>WORD PROBLEMS</p> <ul style="list-style-type: none"> • Solve basic word problems related to numbers, measures, shapes and space. |



ACTIVITY TWO: Basic Numeracy Minimum Learning Achievements (MLA)

Basic Numeracy Minimum Learning Achievements (MLAs) are minimum standards that establish mathematic competencies among different education systems. Basic numeracy MLAs can support teachers in assessing the mathematic competencies of students. They are particularly useful when students move between different education systems, like in the case of refugee students. Indicatively, the Basic Numeracy MLAs correspond to the lower primary mathematics competencies. They are summarized in Table 3 below.



TABLE 3: Basic Numeracy Minimum Learning Achievements (MLAs)

| BASIC NUMERACY MINIMUM LEARNING ACHIEVEMENTS (MLA) | |
|--|---|
| COUNTING | <ul style="list-style-type: none"> • How to match number to number concept for numbers 1 to 999. • How to count forwards and backwards from numbers 1 to 1000. • Understand the number concept of zero (0). |
| NUMBER SEQUENCE | <ul style="list-style-type: none"> • Rank numbers in sequence from numbers 1 to 999. • Recognize and complete number patterns. |
| ARITHMETIC OPERATIONS | <ul style="list-style-type: none"> • ADDITION: add numbers up to 3 digits. • SUBTRACTION: subtract numbers up to 3 digits. • MULTIPLICATION: multiply numbers up to 2 digits. • DIVISION: divide numbers up to 1 digit. |
| WORD PROBLEMS | <ul style="list-style-type: none"> • Solve basic word problems using numbers. |
| SHAPES | <ul style="list-style-type: none"> • Recognize basic shapes: square, triangle, rectangle and circle. |
| FRACTIONS | <ul style="list-style-type: none"> • Recognize fractions and match graphic representations to symbols. |
| MONEY | <ul style="list-style-type: none"> • Recognize all of the fractions of the currency used locally. • How to calculate change. |
| TIME | <ul style="list-style-type: none"> • How to tell time according to the 24 hour international system. |



ACTIVITY THREE: Primary Mathematics Activities

The following table provides some guidelines on how to plan and deliver mathematic lessons using the teaching aids of the UNICEF Primary Mathematics Kit. The activities are divided according to **ARITHMETIC LESSONS** and **GEOMETRY LESSONS** to facilitate the planning and delivery of the lessons. Each teaching aid can be used to teach several lessons and concepts. You will be developing **lesson plans** that are in line with the Mathematics Curriculum used in your context.



YOUR ROLE is to adapt the primary mathematics lessons to your target group, and use the appropriate teaching aids to deliver the lessons.

TABLE 4: Overview of the mathematics activities



| OVERVIEW OF THE MATHEMATICS ACTIVITIES | |
|--|---|
| ARITHMETIC LESSONS | |
| 1. | UNIT ONE: HORIZONTAL ABACUS |
| 2. | UNIT TWO: VERTICAL ABACUS |
| 3. | UNIT THREE: ORAL PRACTICE UNIT |
| 4. | UNIT FOUR: COUNTING RODS |
| 5. | UNIT FIVE: FRACTIONS SET |
| 6. | UNIT SIX: THE CLOCK |
| GEOMETRY LESSONS | |
| 1. | UNIT ONE: PROTRACTOR, SQUARE SET, COMPASS AND ANGLES DEMONSTRATOR |
| 2. | UNIT TWO: SQUARE SET |
| 3. | UNIT THREE: COMPASS |
| 4. | UNIT FOUR: GEOGRAPHIC BOARD |
| 5. | UNIT FIVE: GEOMETRY SET |
| 6. | UNIT SIX: CUBE |
| 7. | UNIT SEVEN: CUBE – VOLUME DEMONSTRATOR |
| 8. | UNIT EIGHT: CUBE – CAPACITY UNIT DEMONSTRATOR |
| 9. | UNIT NINE: CIRCULAR AREAS AND DIAMETER DEMONSTRATOR |
| 10. | UNIT TEN: CYLINDERS – VOLUME AND SURFACE AREA DEMONSTRATOR |
| 11. | UNIT ELEVEN: CONE AND CYLINDER – VOLUME SET |
| 12. | UNIT TWELVE: GEOMETRY FIGURE MAKING CARDS |
| 13. | UNIT THIRTEEN: GEOMETRY CARDS |

ARITHMETIC LESSONS

UNIT ONE: HORIZONTAL ABACUS

THEORY: Learning the decimal system; counting from 1 to 10 and 10 to 20; the concept of difference.

NOTE *These activities are suitable for lower primary pupils and basic numeracy lessons.*

VOCABULARY:
Add on; count on; difference; count back



LEARNING OUTCOMES

At the end of these lessons the students will be able to:

1. count forwards from 0 to 20
2. count backwards from 20 to 0
3. use the correct vocabulary
4. perform simple addition and subtraction up to and including number 20
5. use the correct vocabulary for addition and subtraction
6. divide 10 into groups of 2, 3, 4, and 5
7. understand the concept of 'difference'



ACTIVITIES

ADDITION

(1) Separate the top row of beads into 2 groups (refer to the group on the left as the '1st group', and the group on the right as the '2nd group'). Count all of the beads in the 1st group and write the number down. Count all of the beads in the 2nd group on the right and write the number down. Then, bearing in mind that the top row contains a total of 10 beads, complete the sum:
 + = 10. Repeat the exercise a number of times.



(2) Divide the pupils into groups. Ask the pupils to perform the exercise above using the abacus. Make sure that each group has the opportunity to use the abacus.



(3) Separate the top row of beads into 3 groups. Count all of the beads in the 1st group and write the number down. Count all of the beads in the 2nd group and write the number down. Count all of the beads in the 3rd group and write the number down. Then, bearing in mind that the top row contains a total of 10 beads, complete the sum: + + = 10.

(4) Separate the top row of beads into 4 groups. Count all of the beads in the 1st group and write the number down. Count all of the beads in the 2nd group and write the number down. Count all of the beads in the 3rd group and write the number down. Count all of the beads in the 4th group and write the number down. Then, bearing in mind that the top row contains a total of 10 beads, complete the sum: + + + = 10.

SUBTRACTION

(1) Separate the top row of beads into 2 groups. Count all of the beads in the 1st group and write the number down. Then, bearing in mind that the top row contains a total of 10 beads, complete the operation of subtracting the number of beads in the 1st group from the entire number of beads in the top row:
 10 - =

| UNIT TWO: VERTICAL ABACUS | |
|---|---|
| <p>THEORY: Addition and subtraction operations in units, tens, hundreds, thousands and ten thousands; the concept of 'place value'; the concept of zero (0).</p> | <p>VOCABULARY: Place value; units; tens; hundreds; thousands; odd and even numbers.</p> |
| <p>LEARNING OUTCOMES</p> <p></p> <p>At the end of the lessons the students will be able to:</p> <ol style="list-style-type: none"> count forwards and backwards in tens count forwards and backwards in hundreds count forwards and backwards in thousands count forwards and backwards in hundreds to 1,000 and up to 10,000 add and subtract in tens, hundreds and thousands use the correct vocabulary | <p>ACTIVITIES</p> <p></p> <ol style="list-style-type: none"> Count in tens up to 100. Then up to, say 500. Write down the number 456 on the board and ask the students how this number is read. (four hundred and fifty-six). Ask them why the number is not written as 400506. Discuss place value of the digits 4, 5 and 6. Count in hundreds from 100 to 1,000, and then up to, say 5,000 or 10,000. Write the number 5678 on the board and ask how this number is read (five thousand, six hundred and seventy-eight). Continue the activity with different examples. Use the vertical abacus to show place value. Introduce the term 'place value': the extreme right column being units, then followed by tens, then hundreds, then thousands, then ten thousands. Explain that 1 bead in the units column stands for 1x1; 1 bead in the tens column stands for 1x10; and 1 bead in the hundreds column stands for 1x100. Therefore, 1 bead in different places represents different values. Write numbers on the board and ask pupils to come and show those numbers on the abacus. For example: (a) 56; (b) 234; (c) 999; (d) 2987; (e) 308; (f) 450; (g) 7008. Continue the activity with different examples. Explain why 0 in the column means nothing, and that there is no bead. Explain even and odd numbers—and that 0 is an even number. |

| UNIT THREE: ORAL PRACTICE UNIT | |
|---|--|
| <p>THEORY: The following arithmetic operations: Addition, subtraction, multiplication, and division.</p> <p>NOTE Adapt the content to the age and capacity of your target group.</p> | <p>VOCABULARY: Add on; more than; sum; difference; subtraction; multiplication; product.</p> |
| <p>LEARNING OUTCOMES</p>  <p>At the end of the lessons the students will be able to:</p> <ol style="list-style-type: none"> work out sums with given cards complete addition, subtraction, multiplication and division operations use the correct vocabulary to describe given operations arrange numbers in ascending or descending order make 2-digit numbers from given cards make 3-digit numbers from given cards | <p>ACTIVITIES</p>  |
| <p>(1) Group work. Divide the students into learning-groups. Pick any 2 cards for each learning-group (e.g., 5 and 8)—but, be sure to give a different pair of cards to each group. Ask each group the following questions: (a) <i>What is the sum of the 2 numbers?</i> (b) <i>What is the difference between (subtraction) the 2 numbers?</i> (c) <i>What is the product (multiplication) of the 2 numbers?</i> (d) <i>Which number is bigger? By how much?</i></p> <p>(2) After each group has tried the exercise a few times, you can organize a competition among the groups. The group that answers all of the questions first, wins.</p> <p>(3) Pick any 1 number (e.g., 8). Ask the following questions: (a) <i>Give me 2 numbers/cards that will add up to 8.</i> (b) <i>Give me 2 cards with a difference of 8.</i> (c) <i>Pick 2 numbers that when multiplied will give me 8</i> (d) <i>Continue the same exercise with divisions and subtractions.</i> NOTE Repeat the operations with different numbers.</p> <p>(4) After each group has tried the exercise a few times, you can organize a competition among the groups. The group that answers all of the questions first, wins.</p> <p>(5) Pick any 3 cards and make:</p> <ul style="list-style-type: none"> The biggest 3-digit number; the smallest 3 digit number; find their sum. The biggest 3-digit even number; the smallest 3-digit even number; find their sum. The biggest 3-digit odd number; the smallest 3-digit odd number; find their sum. <p>(6) After each group has tried the exercise a few times, you can organize a competition among the groups. The group that answers all of the questions first, wins.</p> | |

| UNIT FOUR: COUNTING RODS | |
|--|---|
| <p>THEORY: Arithmetic Operations up to 100.</p> <p>NOTE Rods are indicated for lower primary pupils and basic numeracy.</p> | <p>VOCABULARY: Place value; counting on; counting back.</p> |
| <p>LEARNING OUTCOMES</p> <p>At the end of the lessons the students will:</p> <ol style="list-style-type: none"> 1. know the numbers up to 100, and know how to make calculations with them 2. know how to compare different numbers 3. understand tallying 4. know how to count forwards and backwards from 1 to 100 5. know how to use knowledge of place value in tallying 6. know basic number facts | <p>ACTIVITIES</p> <p>(1) Learn numbers up to 100</p> <ul style="list-style-type: none"> • Distribute rods to students, making sure that all of the rods that each individual student has is the same color. Ask the students to count the rods. Ask them to tie the rods into single bundles so that each bundle has 10 rods of the same color. Then ask them to count how many bundles they have. • Students should understand that one bundle represents 10. (Here explain place value on the abacus). Ask the students to count all of the bundles. • Ask 1 student to take 1 bundle and 2 loose rods. This represents $10 + 2 = 12$. Ask the students to write the operation on the blackboard or in their exercise books. Repeat the exercise with other numbers of bundles and loose rods. • Separate the students into groups. Give each group the opportunity to use the rods to count. <p>NOTE Remember that operations should be within 100.</p> <p>(2) Learn to calculate up to 100</p> <ul style="list-style-type: none"> • Take 10 green rods and 3 red rods and ask the pupils how many rods there are in total. • Work out $10 + 3 = 13$. Explain how to count on the basis of tens by breaking up the sum $9 + 4$ into $(9 + 1) + 3 = 13$. Explain that when you're working with sums greater than 10, it is easier to deal with those sums on the basis of tens rather than on the basis of single digits. Repeat this operation with other sums, like $9 + 6 = 15$, $19 + 5 = 24$, and so on. <p>(3) After each group has tried the exercise a few times, you can organize a competition among the learning-groups. The group that gets the most correct answers wins. Sample questions: (a) How much is two bundles and two rods? 22; (b) How much is four bundles and five rods? 45; (c) How much is seven bundles and eight rods? 78; You can make the competition more difficult by using additions and subtractions (e.g., How much is seven bundles and five rods minus two bundles and seven rods? 48).</p> |

UNIT FIVE: FRACTIONS SET

THEORY: The following concepts: Denominator, numerator, equivalent fractions, addition of fractions, and percentage

VOCABULARY: Fraction; whole; part; equivalent fractions; numerator; denominator.

LEARNING OUTCOMES



At the end of the lessons the students will be able to:

1. understand that fraction means a part of a whole
2. understand the difference between numerator and denominator
3. look at basic fractions such as $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{3}{4}$ using the board
4. use basic operations such as addition and subtraction on fractions
5. explain the practical usage and application of fractions



ACTIVITIES

(1) Fractions.

Preparation. Reproduce the chart of FIGURE 2 on the blackboard or on the flip chart. Ask the students to copy the chart in their exercise books. If possible, use colors in drawing the chart. **NOTE** You can split this activity up into 2 lessons. Lesson One would cover 1 to 1/5, and Lesson Two would cover 1/6 to 1/10.

Ask the pupils: *What is the whole and what is the part of the whole?* How many parts of the whole do we have in each figure? **NOTE** Use the Fraction Set to show fractions.

Explain. The number above the fraction line is called the numerator, the number below the fraction line is called the denominator.

FIGURE 2: FRACTIONS CHART



(2) Equivalent fractions.

Fractions such as $\frac{1}{2}$ can have many equivalents. Equivalent fractions are fractions that may look different but have the same value (e.g., $\frac{1}{2}$ and $\frac{2}{4}$). They are equivalent because they both represent half of a whole.

Discuss equivalent fractions and relate them to practical examples. **NOTE** Use the Fraction Set to show equivalent fractions.

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UNIT FIVE: FRACTIONS SET

(3) Percentage (%).

Explain the concept of percentage: the ratio of a number to 100; percent means "per hundred" or out of every hundred.

For example: $25\% = \frac{25}{100}$

or 25 out of every a hundred

$7\% = \frac{7}{100}$

Ask the students to calculate

percentages. How much is 10% of 30? **NOTE** Adjust the difficulty of the calculation to the level of your students.

(4) Percentage (%) using currency.

Give examples of whole numbers and fractions using the currency of your context. Examples with **US DOLLARS**:

50% of an amount is equivalent to half, because $50/100$ is equivalent to $\frac{1}{2}$
 50% of \$40 = $\frac{1}{2}$ of \$40 = \$20;
 25% of \$40 = $\frac{1}{4}$ of \$40 = \$10;

NOTE 10% is the same as dividing the number by 10 (e.g., 10% of \$40 is the same as $\$40 \div 10 = 4$).

NOTE Make sure that you explain the different fractions of the most used notes and coins in your context (e.g., 1 dollar = 100 cents; one dime = 10% of a dollar = 10 cents; one quarter = 25% of a dollar = 25 cents).

NOTE Give practical examples. You can also use role playing to demonstrate the use of different currency at the market or in a shop. You can develop word problems from this activity (e.g., Your mom gives you 1 dollar to buy 1 exercise book. The exercise book costs 50 cents. How much change should you give back to your mom?)

(5) Addition of fractions;

There are 3 Simple Steps to adding fractions:

Step 1: Make sure the bottom numbers (the denominators) are the same.

Step 2: Add the top numbers (the numerators) and put the resulting sum over the denominator.

Step 3: Simplify the fraction (if needed).

EXAMPLE 1

Step 1. The bottom numbers (the denominators) are already the same.

$$\frac{1}{4} + \frac{1}{4}$$

Step 2. Add the top numbers and put the answer over the same denominator.

$$\frac{1}{4} + \frac{1}{4} = \frac{1+1}{4} = \frac{2}{4}$$

Step 3. Simplify the fractions.

$$\frac{2}{4} = \frac{1}{2}$$

In picture form it looks like this: FIGURE 3: ADDITION OF FRACTIONS



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UNIT FIVE: FRACTIONS SET

EXAMPLE 2




What happens when $\frac{1}{2}$ is added to $\frac{1}{4}$?


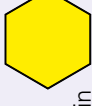

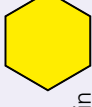
- Find the minimum common denominator
- Adjust the nominator



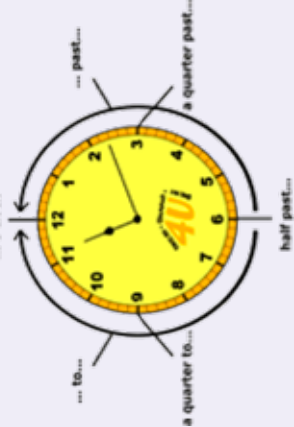
$$\frac{1}{2} + \frac{1}{4} = \frac{2+1}{4} = \frac{3}{4}$$

FIGURE 4: FRACTIONS USING GEOMETRIC FIGURES

(6) Fractions using geometric figures: Ask the pupils to answer the following questions:

(a) How many  are in  ? Answer: **2** (b) How many  are in  ? Answer: **3**

(c) How many  are in  ? Answer: **2** (d) How many  are in  ? Answer: **6**

| <p>UNIT SIX: THE CLOCK</p> | |
|---|--|
| <p>THEORY: Reading the time; understanding fractions.</p> | <p>VOCABULARY: Hours; minutes; seconds.</p> |
| <p>LEARNING OUTCOMES</p>  <p>At the end of the lessons the students will be able to:</p> <ol style="list-style-type: none"> 1. read the time on a non-digital clock 2. understand the units of time: hours, minutes and seconds 3. understand the relationship between the units of time: 1 day = 24 hours; 1 hour = 60 minutes; 1 minute = 60 seconds 4. apply basic operation skills of addition and subtraction involving time 5. know that half past is the same as 30 minutes, and that a quarter means 15 minutes | <p>ACTIVITIES</p>  |
| <p>(1) Learn the units of time. Introduce the 3 hands of the clock: THE HOUR HAND, THE MINUTE HAND and THE SECOND HAND. When 1 hand moves the other 2 will also move. Explain that when the hour hand moves from 1 number to the next, then 1 hour is covered. Move the minute hand from 1 number to another. Explain that this is 5 minutes. Move it to half past and full time.</p> <p>(2) Show full time (o'clock) on the clock face (e.g., 2 p.m. or 5 p.m.) and ask the pupils: <i>What time is it?</i> Ask each student of the class to read the full time on the clock.</p> <p>(3) Telling the Time using half past; quarter past; quarter to. Show the time according to half past (or 30 minutes past), quarter past (or 15 minutes past), quarter to (or 15 minutes to).</p> <p>FIGURE 5: THE CLOCK</p>  <p>(4) Divide the students into learning groups. Arrange a competition. Each group will try to identify the correct time you set on the clock. The group that gets most correct answers wins.</p> <p>(5) The relationship between units of time. Count with the class the minute units on the whole clock: 1 hour has 60 minutes; 1 minute has 60 seconds. NOTE This is the international convention on telling time. Compare the international convention with the way it is common to tell the time in your context and culture (e.g., the Orthodox or to Islamic prayers).</p> <p>(6) Use the clock to learn fractions Explain that midday (12 noon) means half of the day—the first 12 hours in a 24 hour day. Draw similar examples: 30 minutes are half of an hour; six o'clock is a quarter of a day (24 hours).</p> | |

GEOMETRY LESSONS

UNIT ONE: PROTRACTOR; SQUARE SETS; COMPASS; ANGLES DEMONSTRATOR

THEORY: Different types of angles. Explain the different types of angles by drawing the angles on the blackboard or on a large flip chart using the compass, the square sets and the protractor. Use FIGURE 6 as a reference.

VOCABULARY: Protractor; square set; compass; angle; acute; obtuse; reflex; straight; circle.



LEARNING OUTCOMES

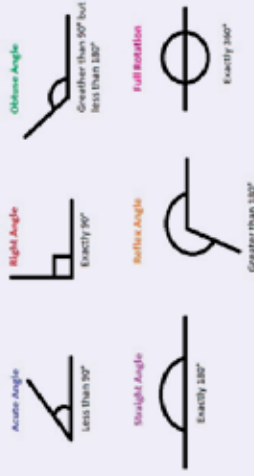
1. describe angles less than 90° , more than 90°
2. know that 90° is called a right angle
3. know that more than 90° is called an obtuse angle
4. know that less than 90° is called an acute angle
5. know that 180° is called a straight angle
6. know that greater than 180° is called a reflex angle
7. know that 360° is a full rotation and it equals a circle
8. measure angles using the protractor
9. predict and estimate angles

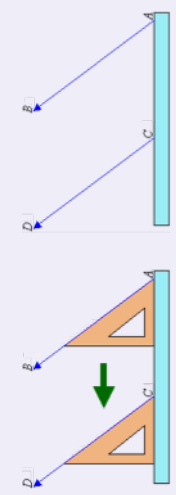






ACTIVITIES


- (1) Divide the students into pairs. Invite the students to use parts of the body like hands, fingers, elbows and arms to make angles. Ask the students to demonstrate angles that are: 'close to 90° ', 'more than 90° ' and 'less than 90° '.
- (2) Name and explain the parts of a protractor and demonstrate how to use it.
- (3) Draw an angle that is less than 90° . Place the center mark of the protractor at the angle's intersection. Place the zero edge of the protractor on 1 of the lines of the angle. Explain when to use the inner scale and when to use the outer scale.
- (4) Draw an angle that is between 90° and 180° . Measure it using the protractor.
- (5) Draw an angle that is between 180° and 360° .
- (6) Extend the angle estimation to as many parts of the body as possible.
- (7) Identify 3 structures that form an angle within the environment. For example, the edge of a table, a window, or a door.
- (8) Use 2 sticks to form angles and measure them.
- (9) Use the angle demonstrator to show the different angles.
- (10) Divide the students into learning-groups. Ask each group to demonstrate different types of angles using the angle demonstrator.




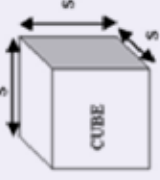
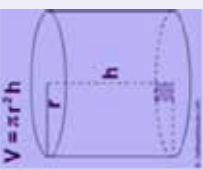
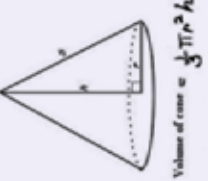
FIGURE 6: TYPES OF ANGLES









| <p>UNIT TWO: SQUARE SETS</p> | |
|--|--|
| <p>THEORY: Definition of parallel lines; definition of perpendicular lines</p> | <p>VOCABULARY: Parallel; perpendicular.</p> |
| <p>LEARNING OUTCOMES</p> <p>At the end of the lessons the students will be able to:</p> <ol style="list-style-type: none"> 1. understand the difference between the 2 types of set squares 2. use the set squares to draw parallel lines 3. understand the meaning of parallel lines 4. understand the meaning of perpendicular lines | <p>ACTIVITIES</p> <p>(1) Drawing Parallel Lines. Use the ruler and the square set to draw parallel lines as described below. NOTE If you do not have a ruler, use the second set square instead. Parallel lines are parallel if they are always the same distance apart (called “equidistant”), and will never meet.</p> <p>Step 1: Position an edge of the set square against a ruler and draw a line along one of the edges.</p> <p>FIGURE 7: PARALLEL LINES</p>  <p>Step 2: Slide the set square into a new position while keeping the ruler fixed exactly at the same position.</p> <p>Step 3: Draw a line along the same edge that was used in Step 1.</p> <p>(2) Drawing Perpendicular Lines. Use the ruler and the square set to draw a perpendicular line at a point on a given line as described below.</p> <p>Step 1: Set an edge of the set square on the given line so that the other edge is just in contact with the point.</p> <p>Step 2: Draw a line that passes through the given point with the help of the set square. Perpendicular lines are lines that are at right angles (90°) to each other.</p> <p>FIGURE 8: PERPENDICULAR LINES</p>  |

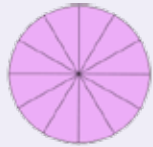
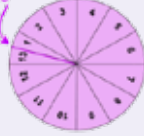
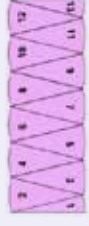

| UNIT THREE: COMPASS | |
|---|--|
| THEORY: Definition of parallel lines; definition of perpendicular lines | VOCABULARY: Circle; diameter; circumference; center |
| <div style="text-align: center; margin-bottom: 10px;">  </div> <p>LEARNING OUTCOMES</p> <p>At the end of the lessons the students will be able to:</p> <ol style="list-style-type: none"> 1. explain the terms radius, diameter, circle and circumference 2. use a compass to draw circles of given radii | <div style="text-align: center; margin-bottom: 10px;">  </div> <p>ACTIVITIES</p> |
| <p>FIGURE 9: EXAMPLE OF A CIRCLE</p> <div style="text-align: center;">  </div> <ol style="list-style-type: none"> (1) Draw a circle on the blackboard with a compass: <ul style="list-style-type: none"> • make sure that the hinge at the top of the compass is tightened so that it does not slip • tighten the metal butterfly screw to hold the chalk • align the chalk with the compass' base • press down the suction foot to ensure stability and turn the knob at the top of the compass to draw the circle • Measure the radius of the circle using the blackboard ruler, or in its absence, the square set • Measure the diameter of the circle (2) Ask students to draw circles of given (a) radii and (b) diameters on the blackboard or in their exercise books. (3) Discuss places where circles are used (e.g. wheels of a bicycle or a car). (4) Explain. All points on a circle are the same distance from the center. The circle is a plane shape (2-dimensional). <p>A circle: the set of all points on a plane that are a fixed distance from a center. The Radius is the distance from the center of the circle to the edge. The Diameter is the distance starting from one side of the circle, going exactly through the center, and ending on the other side of the circle. The Circumference is the distance around the edge of the circle. Circumference = $2 \times \pi \times \text{radius}$</p> <ol style="list-style-type: none"> (5) Explain. When you divide the circumference by the diameter, you get 3.141592654..., which is the number π (Pi). So when the diameter is 1, the circumference is 3.141592654...; π (Pi) = 3.141 | |


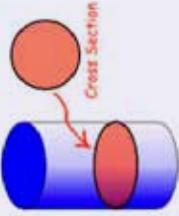
| <p>UNIT FOUR: GEOGRAPHIC BOARD</p> | |
|---|--|
| <p>THEORY: Definitions of square, rectangle, triangle, polygon, and trapezoid (or trapezium); definition of perimeter.</p> | <p>VOCABULARY: Square, rectangle, triangle, polygon, trapezoid and perimeter</p> |
| <p>LEARNING OUTCOMES</p> <p>At the end of the lessons the students will be able to:</p> <ol style="list-style-type: none"> 1. use the board to make different 2-dimensional (2D) shapes like squares, rectangles, triangles, and trapezoids 2. explain how to find the perimeter of squares, rectangles, triangles, and trapezoids 3. know how to find the perimeter of the shapes made | <p>ACTIVITIES</p>  |
| <p>(1) Explain. Polygons are 2-dimensional (2D) shapes. They are made of straight lines, and the shape is “closed” (all of the lines connect up). Examples of polygons are triangles, quadrilaterals and pentagons.</p> <p>(2) Explain. A square is a 4-sided flat shape with straight sides where all sides have equal length, and every angle is a right angle (90°). It is a Quadrilateral and a Regular Polygon. Show how to use the geographic board to make a square of different sizes: (a) 2 units by 2 units; (b) 3 units by 3 units; (c) 4 units by 4 units. Ask a pupil to demonstrate to the rest of the class how to make a square using the geographic board.</p> <p>(3) Take 1 of the squares and use a ruler to measure the length of each side. Add these 4 lengths. This is the perimeter of the square. Ask the students in turns to use the geographic board to demonstrate how to calculate the perimeter of a square. Repeat the calculation of the perimeter with bigger squares. Explain. The perimeter is the distance around a 2-dimensional shape. The perimeter of a circle is called the circumference.</p> <p>(4) Use the geographic board to make a rectangle. Explain. A rectangle is a 4-sided flat shape with straight sides where all interior angles are right angles (90°). Also, opposite sides of a rectangle are parallel and of equal length. A square is a special type of rectangle. Take 1 rectangle and use a ruler to measure the length of each side. Add these 4 lengths. This is the perimeter of the rectangle. Ask the students to calculate the perimeters of different rectangles.</p> <p>(5) Use the geographic board to make a triangle. Show the students that a triangle can be obtained by dividing a square into 2 along the diagonals. Explain the different types of triangles: Isosceles (a triangle with 2 sides of equal length), Equilateral (a triangle with all angles equal to 60°), Right (a triangle with a right angle) and Acute (a triangle with all angles less than 90°). Add the 3 lengths of the triangles to measure the perimeter. Ask the students to calculate the perimeters of different triangles.</p> <p>(6) Use the geographic board to make a trapezoid. A trapezoid is 4-sided flat shape with straight sides that has a pair of opposite sides that are parallel. The sides that are parallel are called “bases.” The other sides are called “legs” (which may or may not be parallel). Ask the students to calculate the perimeters of different trapezoids.</p> | |




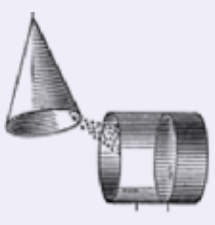
| UNIT FIVE: GEOMETRY SET | |
|--|--|
| <p>THEORY: Definition of regular solids; definition of cubes and cuboids; definition of cylinders; definition of cones.</p> <p>NOTE <i>The calculation of the volume of cylinders and cones is for advanced students.</i></p> | <p>VOCABULARY: Cubes; cuboids; cylinders; hollow-cylinder; cones; regular solids</p> |
| <p style="text-align: center;"></p> <p>LEARNING OUTCOMES</p> <p>At the end of the lessons the students will be able to:</p> <ol style="list-style-type: none"> 1. know the characteristics of geometric figures (i.e., cuboids, cubes, cones and cylinders) 2. know how to calculate the volume of the geometric figures | <p style="text-align: center;"></p> <p>ACTIVITIES</p> <p>(1) Explain the volume of regular solids. Solids relate to 3-dimensional space (3D), the kind of space we live in. Solids have properties (special things about them), such as: volume (think of how much water it could hold) and surface area (think of the area you would have to paint).</p> <p>Demonstrate that the base area is the surface on which the solid is resting. The Volume of a solid = Base Area x Height of the solid. NOTE Use the geometry set to show the <i>different solids and how to calculate their volumes</i>.</p> |
| <p>FIGURE 10: CUBOID</p>  | <p>(2) Calculate the volume of a cuboid. A cuboid is a 3-dimensional shape. So to work out the volume we need to know 3 measurements: width, length and height. The Volume of a cuboid = Base Area (Length x Width) x Height, usually shortened to $V = l \times w \times h$</p> |
| <p>FIGURE 11: CUBE</p>  | <p>(3) Calculate the volume of a cube. NOTE See Unit 6 for definition.</p> <p>The Volume of a cube = Length x Length x Length (L^3) or (Base Area) x Height, $(s \times s) \times s$</p> |
| <p>FIGURE 12: CYLINDER</p>  | <p>(4) Calculate the volume of a cylinder. The volume of a cylinder is the number of cubic units that will exactly fill that cylinder. Although a cylinder is technically not a prism, it shares many of the properties of a prism. Like prisms, the volume of a cylinder is found by multiplying the area of one end of the cylinder (base) by its height. Because the end (base) of a cylinder is a circle, the area of that circle is given by $area = \pi r^2$</p> <p>Multiplying by the height h we get $volume = \pi r^2 h$ where: π is Pi, approximately 3.142</p> <p>r is the radius of the circular end of the cylinder</p> <p>h is the height of the cylinder</p> |
| <p>FIGURE 13: CONE</p>  | <p>(5) Calculate the volume of a cone. A cone has a circular base and a vertex that is not on the base. Cones are similar in some ways to pyramids. They both have just 1 base and they converge to a point—the vertex. Because the base area is a circle, we can substitute the area formula for a circle into the volume formula. The formula for the volume of a cone is: $v = \frac{1}{3} \pi r^2 \cdot h$</p> |


| UNIT SIX: CUBE | |
|---|--|
| THEORY: Definition of cubes, length and width; counting from 1 to 100. | VOCABULARY: Cube; length; width; addition; subtraction |
| LEARNING OUTCOMES  | ACTIVITIES  |
| <p>At the end of the lessons the students will be able to:</p> <ol style="list-style-type: none"> count from 1 to 100 in ones count from 1 to 100 in twos backward place value using colors define a cube | <p>(1) Count from 1 to 100 Use the parts of the cube to count from 1 to 100. Ask the pupils to count in 1s from 1 to 100 and backwards to 1. Then ask the students to count in 2s from 2 to 100 and backwards to 2.</p> <p>(2) Learn to place value Use the 5 different colored cubes and give them place values (e.g., the blue cube can be units, the red cube tens, the green cube hundreds, the yellow cube thousands. Use the cubes to make a number (e.g., 15 = 1 red cube for tens and 5 blue cubes for units; 236 = 2 green, 3 red and 6 blue; and so on. Ask the students to demonstrate different numbers.</p> <p>(3) Calculations Use the cubes to study number bonds. For this activity, all of the cubes have a value of 1. First pick a given sum—for example, 20. Then count out 20 cubes. Next, divide the 20 cubes into 2 separate groups—for example, 7 cubes in Group A, and 13 cubes in Group B. Ask they students to complete the equation: + = 20 (7 + 13 = 20). Then ask the students, <i>How many different ways can you make a sum of 20 from 2 groups of cubes?</i> (e.g., 13 + 7 = 20; 2 + 18 = 20) Repeat the exercise for 3 groups of cubes and 4 groups of cubes:</p> <p>..... + + = 20</p> <p>..... + + + = 20</p> <p>(4) Definition of cube A cube is a region of space formed by 2 identical square faces joined along their edges. Give the fully assembled cube to each learning-group in turn. Ask the students to count the total number of smaller cubes contained in the fully assembled cube. Ask the students to count the length, width and height of the cube and calculate its volume. NOTE See <i>Unit 7</i>.</p> |


| UNIT SEVEN: CUBE – VOLUME DEMONSTRATOR | |
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| <p>THEORY: Definition of volume; cubic meters; cubic decimeters and cubic centimeters.</p> | <p>VOCABULARY: Cubic meter; cubic decimeters; cubic centimeters</p> |
|  |  |
| <p>LEARNING OUTCOMES</p> <p>At the end of the lessons the students will be able to:</p> <ol style="list-style-type: none"> 1. understand what is meant by a cubic meter, cubic decimeter and cubic centimeter 2. demonstrate the relationship between cubic meters, cubic decimeters and cubic centimeters 3. calculate the volume of a cube | <p>ACTIVITIES</p> <ol style="list-style-type: none"> (1) Explain the definition of volume of a cube. Volume is the measure of the amount of space inside of a solid figure, like a cube, ball, cylinder or pyramid. Its units are always “cubic”—that is, the number of little element cubes that fit inside the figure. Use the volume demonstrator to show the units contained in a given cube. (2) Explain the system of measuring. A cube that is 1 m on each side has a volume of 1 cubic meter (1 m³). Since 1 m = 100 cm, work out how many cubic centimeters (cm³) are in 1 m³. Use the comparison 1 m x 1 m x 1 m, which is the same as 100 cm x 100 cm x 100 cm. Ask the students to help you. Repeat the demonstration several times. Divide the pupils into learning-groups and ask each group to demonstrate the relationship using the cube-volume demonstrator. (3) Use the same concept to work out cubic decimeters (dm³). Repeat the demonstration several times. Divide the pupils into learning-groups and ask each group to demonstrate the relationship using the cube-volume demonstrator. |
| UNIT EIGHT: CUBE – CAPACITY UNIT DEMONSTRATOR | |
| <p>THEORY: Definition of capacity; capacity of cubes; definitions of milliliter, deciliter and centiliter.</p> | <p>VOCABULARY: Capacity; milliliter; deciliter; centiliter</p> |
|  |  |
| <p>LEARNING OUTCOMES</p> <p>At the end of the lessons the students will be able to:</p> <ol style="list-style-type: none"> 1. show that 1000 ml is equivalent to 1 dm³ using the cube-capacity demonstrator 2. understand the difference between volume and capacity 3. calculate volume and capacity | <p>ACTIVITIES</p> <ol style="list-style-type: none"> (1) Explain the concept of capacity. Capacity is the amount that something can hold. Usually it means volume, such as milliliters (ml) or liters (l) in the Metric System of Measurement, or pints or gallons in the Imperial System of Measurement (e.g., “The bucket has a capacity of 9 liters”). Capacity can also be general: “He has a great capacity for work.” Discuss with the students. (2) Explain. A cubic meter (m³) is equal to 1,000 liters. 1 m³ = 1,000 l. (3) Take 1000 ml of water using a measuring cylinder, and pour the water into the transparent cubic vessel. Discuss with the students. (4) Put the 1 dm³ cube into the transparent cubic vessel, and show that the volume of 1 dm³ is equal to the 1000 ml capacity. Explain the difference between volume and capacity. (5) Ask the pupils to repeat the operation in learning-groups. |

| UNIT NINE: CIRCULAR AREAS AND DIAMETER DEMONSTRATOR | |
|--|--|
| LEARNING OUTCOMES | ACTIVITIES |
| <p>THEORY: Definitions of circle, circumference, and area.</p> <p>VOCABULARY: Circle; circumference; area</p> | <p>THEORY: Definitions of circle, circumference, and area.</p> <p>VOCABULARY: Circle; circumference; area</p> |
| <p>At the end of the lessons the students will be able to:</p> <ol style="list-style-type: none"> deduce the area of a circle using the circumference and diameter understand the relationship between the circumference of the circle and the width and height of the derived rectangular object work out the area of the circle and relate it to the derived rectangular object | <p>FIGURE 14: 12 EQUAL SEGMENTS OF A CIRCLE</p>  <p>FIGURE 15: CUT 1 SECTOR IN HALF</p>  |
| <p>STEP ONE: Draw a circle on a flip chart or in an exercise book.</p> <p>NOTE Use a piece of paper that is big enough for all of the students to see. Divide the circle into 12 equal segments.</p> | <p>STEP TWO: Divide just 1 of the sectors into 2 equal parts. You now have 13 sectors. Number them 1 to 13. Cut out each segment and rearrange it like in FIGURE 17.</p> |
| <p>FIGURE 16: MAKE A RECTANGULAR OBJECT</p>  | <p>FIGURE 17: CALCULATE THE AREA OF A CIRCLE</p>  |
| <p>STEP THREE: Rearrange the 13 sectors to resemble a rectangle.</p> <p>Ask the students: <i>What would be the (approximate) height and width of the rectangle?</i></p> | <p>STEP FOUR: Explain. The height of the rectangular object is equal to the radius of the original circle. Look at FIGURE 16. When the segments were in the circle they were "radius" high.</p> <p>The width is equal to the sum of half of the curved parts along the circle's edge; in other words, it is about half the circumference of the circle.</p> <p>We know that the Circumference = $2 \times \pi \times \text{radius}$. The width is half the circumference = $\pi \times \text{radius}$. Now we just multiply the width by the height to find the area of the rectangle:</p> <p>Area = $(\pi \times \text{radius}) \times (\text{radius}) = \pi \times \text{radius}^2$.</p> <p>Conclusion: The Area of Circle = πr^2</p> <p>NOTE The rectangle made by the sectors is not an exact match. We could get a better result if we divided the circle into 25 sectors (23 with an angle of 15° and 2 with an angle of 75°). And the more we divided the circle up, the closer we would get to being exactly right.</p> |

| UNIT TEN: CYLINDERS – VOLUME AND SURFACE AREA DEMONSTRATOR | |
|--|---|
| <p>THEORY: Definition of cylinders; volume of cylinders; area of cylinders; closed cylinders; open cylinders.</p> | <p>VOCABULARY: Volume; cylinder; surface area; open cylinders; closed cylinders. r</p> |
| <p style="text-align: center;"></p> <p>LEARNING OUTCOMES</p> <p>At the end of the lessons the students will be able to:</p> <ol style="list-style-type: none"> 1. identify the main types of cylinders 2. understand that a cylinder is made up of 2 circles and a rectangle 3. work out the surface area of a cylinder 4. work out the volume of a cylinder | <p style="text-align: center;"></p> <p>ACTIVITIES</p> <p>(1) Explain. Definition of cylinder. A Cylinder is a solid object with: (a) 2 identical flat ends that are circular or elliptical; and (b) 1 curved side. A cylinder has the same cross-section from 1 end to the other. Use the Demonstrator to show the parts of a cylinder. An Open Cylinder has 1 or both circular bases open. A Closed Cylinder has both ends sealed or closed. Use the Demonstrator to show the different parts of a cylinder.</p> |
| <p>FIGURE 18: CROSS SECTION OF A CYLINDER</p>  | <p>(2) Explain how to calculate the Surface Area of the cylinder.</p> <p>STEP 1: Identify the cross section of a cylinder. Show it to the students using the Demonstrator Set. NOTE See <i>Geometry Unit Nine</i>.</p> <p>STEP 2: Identify the top end, the bottom end, and the surface area of the side using the Demonstrator Set.</p> |
| <p>FIGURE 19: SURFACE AREA OF A CYLINDER</p>  | <p>STEP 3: Explain. To find the Surface Area of a Cylinder you have to add the surface area of each end plus the surface area of the side. Each end is a circle—thus, the surface area of each end is $\pi \times r^2$, where r is the radius of the end.</p> <p>NOTE See <i>Geometry Unit Nine</i>. There are 2 ends. Therefore their combined surface area is $2 \times \pi \times r^2$. The surface area of the side is the circumference times the height or $2 \times \pi \times r \times h$, where r is the radius and h is the height of the side.</p> <p>The Surface Area of a Cylinder = $2 \pi r^2 + 2 \pi r h$</p> |
| <p>(3) Explain. Calculate the Volume of a Cylinder. Multiply the area of the circle by the height of the cylinder:</p> <p>Area of the circle: $\pi \times r^2$ Height: h Volume = Area \times Height = $\pi \times r^2 \times h$</p> <p>NOTE See <i>Geometry Unit Three</i>.</p> | |

| UNIT ELEVEN: CONE AND CYLINDER – VOLUME SET | | | | |
|--|--|---|--|--|
| <p>THEORY: Definitions of cone and cylinder; volume of cones; volume of cylinders</p> | <p>VOCABULARY: Volume; surface area; cone; vertex; base</p> | <p>ACTIVITIES</p>  | | |
| <p>LEARNING OUTCOMES</p>  <p>At the end of the lessons the students will be able to:</p> <ol style="list-style-type: none"> 1. know the definition of cones and cylinders 2. understand how to derive the formula of the volume of a cone 3. explain the relationship between the volume of the cone and the volume of the cylinder | <p>FIGURE 20: CONE</p>  | <p>(1) Explain. A Cone is a solid (3-dimensional) object that has a circular base and one vertex. A Vertex is a point where 2 or more straight lines meet. A corner. The plural of vertex is "vertices".</p> | <p>(2) Explain. Show that the volume of the cone is equal to one-third of the volume of the cylinder. Fill the cone with water and then pour it into the cylinder 3 times. The cylinder should be filled to the brim.</p> <p>NOTE Use the Cone and Cylinder Volume Set.</p> <p>The Volume of the Cylinder = 3 times the Volume of the Cone</p> | |
| <p>(3) Explain. Show the relationship between the volume of the cone and the volume of the cylinder. The volume formulas for cones and cylinders are very similar:</p> <p>The volume of a cylinder is: $\pi \times r^2 \times h$</p> <p>The volume of a cone is: $\pi \times r^2 \times (h/3)$</p> <p>So, the only difference is that a cone's volume is one third (1/3) of a cylinder's.</p> | <p>FIGURE 21: VOLUME OF A CONE</p>  | | | |

| UNIT TWELVE: GEOMETRY FIGURES CARDS | |
|---|---|
| <p>THEORY: Cuboids; triangles; trapezoids.</p> | <p>VOCABULARY: Cuboids; triangles; trapezoids</p> |
| <p>LEARNING OUTCOMES</p> <p>At the end of the lessons the students will be able to:</p> <ol style="list-style-type: none"> 1. describe geometric shapes and identify characteristics 2. describe how to find volume and area | <p>ACTIVITIES</p> <p></p> <p>(1) Divide the students into learning-groups. Give each group 1 or 2 geometry cards. Ask each learning-group to describe the geometric figure that they composed. NOTE See <i>Geometry Unit Four and Five for definitions.</i></p> <p>(2) Arrange a competition. Distribute 3 geometry cards to each group. Ask each group to write the characteristics of the geometric figures and the relative formulas to find volume and area. NOTE Make sure that the questions cover what is explained in class. The learning-group that gives the most correct answers in the shortest amount of time wins.</p> |

| UNIT THIRTEEN: GEOMETRY FIGURE MAKING CARDS | |
|---|--|
| <p>THEORY: Cubes; cuboids; cylinders; and cones.</p> | <p>VOCABULARY: Cubes; cuboids; cylinders; cones</p> |
| <p>LEARNING OUTCOMES</p> <p>At the end of the lessons the students will be able to:</p> <ol style="list-style-type: none"> 1. identify cubes, cuboids, cylinders and cones 2. explain the characteristics of cubes, cuboids, cylinders and cones 3. demonstrate how to use scissors properly and safely | <p>ACTIVITIES</p> <p></p> <p>(1) Divide the pupils into learning-groups. Give each group a geometry figure making card. Provide safe scissors (blunt) and ask the pupils to carefully cut out the different figures. NOTE You can make photocopies of the cards in order to make them last longer and to enable more pupils to use them.</p> <p>(2) Compare results. Ask each group to describe the characteristics of the geometric figures that they composed. NOTE See <i>Geometry Unit Five for definitions.</i></p> |

