

UNIT1. READY, STEADY, GO!

Subject:
SCIENCE

Timing:
Lessons 1 and 2

Level:
5th and 6th GRADE

Aim: Identify different situations where there is motion.
Use lines and arrows in sketches to show the trajectory of the bodies.

TRANSFERABLE SKILLS (contribution to competences)

Communicative skills:

Can express thoughts and organize information efficiently.
Can give explanations and give opinions about concrete observed facts.

Methodological skills:

Can understand and interpret physical processes by using ITC resources.
Can transform information into knowledge activating thinking skills in order to organize, relate, analyse, synthesise, make inferences and deduct different physical processes.

TEACHING OBJECTIVES

- To present the different kinds of motion of the bodies.
- To provide learners with different situations where there is motion.
- To demonstrate in real situations to take into account the velocity of bodies/objects.

LEARNING OUTCOMES

CONTENT

To know about:

Kinds of motion.
No motion, static objects/bodies.
Instruments to collect data: metric tape and chronometer.
Velocity of bodies in motion.

To be able to:

Predict the motion of the objects.
Describe the motion of different objects.
Use arrows to describe/draw the trajectory of the bodies.

COMUNICATION

Language of learning

Nouns: rectilinear motion, parabolic motion, circular motion, oscillating motion, elliptical motion, static body, straight line, parabola, oscillation, circle, ellipse, trajectory, arrow and direction.

Verbs: to lift, to move, to raise, to go down, to drop, to press, to move forward, to stand up, to turn, to move up, to move down and to move across

Adjectives: very, too, quite, rather,

<p>Predict the results of a race looking at data and the velocity. Calculate the velocity of the objects/bodies.</p>	<p>fairly, so, such, enough Adverbs: fast, slowly, here, there, above, everywhere, away, certainly, indeed, of course, perhaps, firstly, secondly, lastly, finally...</p>
<p>To be aware of: Different kinds of motion and that it is possible to calculate its velocity. The rigor of using data to understand one phenomenon.</p>	<p>Language for learning Identifying/classifying</p> <ul style="list-style-type: none"> - It's a... - I/we found ... - We classified/our classification is...
<p>COGNITION Understanding the concepts of motion and trajectory of the bodies. To describe the motion of different bodies/objects using arrows. To classify the information about motion to make a poster for the class. Extract main information from the data of the grid of velocity and predict the possible results of velocity.</p>	<p>Explaining</p> <ul style="list-style-type: none"> - It has... - It can... - It is used for... <p>Predictions/checking I/we think that the direction of ... will... I/we checked...</p>
<p>CULTURE Applying to the prior knowledge of pupils in everyday phenomena in science class. Every phenomenon on Earth has a scientific explanation but sometimes we don't know it. Appreciate science as a media to solve most of that phenomenon.</p>	<p>Giving reasons Why? Because...</p> <p>Language through learning -Use of dictionaries for vocabulary extension -Questions that are raised in the sessions.</p>

ASSESSMENT

Students should be able to:

- Name the different motions and the line that these describe.
- Identify the direction of the motion and its trajectory.
- Cooperate when working in pairs.
- Understand the process of calculating the velocity.
- Use and identify the functions of the laboratory materials: tape measure and chronometer/stop watch.

UNIT2. FORCES IN ACTION

Subject:
SCIENCE

Timing:
Lessons 3, 4, 5 and 6

Level:
5th and 6th GRADE

Aim: Identify different situations where objects are pushed or pulled.
Newton’s Laws of motion let us understand how forces work.

TRANSFERABLE SKILLS (contribution to competences)

- Communicative skills:**
 Can express thoughts and organize information efficiently.
 Can give explanations and give opinions about concrete observed facts.
- Methodological skills:**
 Can understand and interpret physical processes by using ITC resources.
 Can interpret and put into practice processes of mathematical reasoning leading to solving the problems and questions in everyday situations.
- Personal, social and civic skills:**
 Can develop activities investigating the effects of the forces on objects.

TEACHING OBJECTIVES

- To present the different kinds of forces that are applied upon bodies/objects by using Newton’s ‘*Laws of motion*’.
- To use laboratory equipment to record and analyze data.
- To demonstrate the effect of forces on bodies/objects in real situations.

LEARNING OUTCOMES

CONTENT	COMUNICATION
<p>To know about: How pushes and pulls can produce different effects on objects/bodies: can start or stop the motion, can change the shape or can change the direction of the motion. How forces are calculated in newtons. Contact and non-contact forces.</p>	<p>Language of learning</p> <p>Nouns: force, friction, gravity, contact force, magnetism, unbalanced force, balanced force, weight, mass, contact force, non-contact force, pull, push, dynamometer, taper measure, weight scale, newtons, centimeters, grams.</p>
<p>To be able to: Predict the results of an experiment. Record data by using laboratory tools: weighing scale, dynamometer, tape measure, Analyze the effect of the forces with the results of an experiment and produce a scientific conclusion.</p>	<p>Verbs: to lift, to move, to raise, to go down, to drop, to press, to move forward, to stand up, to turn, to move up, to move down and to move across, to go/move forward/backward.</p> <p>Adjectives: very, too, quite, rather, fairly, so, such, enough</p>

<p>To be aware: Of the physics difference between mass and weight. That the weight is a force that changes depending on the gravity.</p>	<p>Adverbs: fast, slowly, here, there, above, everywhere, away, certainly, indeed, of course, perhaps, firstly, secondly, lastly, finally...</p>
<p>COGNITION</p> <p>Classifying different pictures depending on if the force is a push or is a pull. Predicting the result of an experiment looking at data table. Creating a structure to analyze friction and collect data.</p>	<p>Language for learning</p> <p>Identifying/classifying It's a... I/we found ... We classified/our classification is...</p> <p>Explaining It has... It can... It is used for...</p> <p>Predictions/checking I/we think that... I/we checked...</p>
<p>CULTURE</p> <p>Recognize the importance of Newton's Laws of motion with the explanations of physic phenomenon. Distinguish the relation between forces and the movement of the bodies/objects in everyday situations.</p>	<p>Playing / working It's my turn/it's your turn. Who starts?</p> <p>Giving reasons Why? Because...</p> <p>Language through learning</p> <p>Use of dictionaries for vocabulary extension. Questions that are raised in the sessions.</p>

ASSESSMENT

Students should be able to:

- Know that pushes and pulls can make things start or stop moving.
- Predict what might happen in a scientific experiment
- Make measurements using laboratory tools: weighing scale, dynamometer and tape measure.
- Enter results into a simple data table.
- Write an appropriate conclusion by analysing the data table and the results of the experiment.
- Cooperate when working in pairs.

UNIT3. MACHINES

Subject:
SCIENCE

Timing: Lessons 7, 8,
9, 10, 11, 12, 13 and 14

Level:
5th and 6th GRADE

Aim: To use the scientific knowledge to understand everyday situations where machines are used.
Recognize simple machines and compound machines in everyday objects.

TRANSFERABLE SKILLS (contribution to competences)

- Communicative skills:**
 Can express thoughts and organize information efficiently.
 Can give explanations and give opinions about concrete observed facts.
- Methodological skills:**
 Can understand and interpret physical processes by using ITC resources.
 Can transform information into knowledge activating thinking skills in order to organize, relate, analyse, synthesise, make inferences and deduct different physical processes.
- Personal, social and civic skills:**
 Can create, initiate, develop and assess both individual and collective activities to build a compound machine.

TEACHING OBJECTIVES

- To identify and classify everyday objects depending on their simple machine.
- To identify the fulcrum, the load and the effort in simple machines.
- To know the function of the lever.
- To apply the concepts of motion and force during the creation of their machine.
- To create their own compound machine using simple machines.

LEARNING OUTCOMES

CONTENT	COMUNICATION
<p>To know: A machine is a device that:</p> <ul style="list-style-type: none"> - Increases or multiplies a force. - Increases or multiplies the speed. - Changes the direction of the force. - Reduces friction. 	<p>Language of learning Nouns: load, effort, fulcrum, lever, inclined plane, first class lever, second class lever, third class lever, wheel and axle, screw, pulley, wedge, object, Verbs: to lift, to move, to cut, to spread, to raise, to go down, to drop,</p>

<p>Parts of a simple machine: fulcrum, effort and load. The law of the lever.</p> <p>To be able to: Classify and identify the different simple machines. Make predictions about the movement of the effort and the load in a simple machine. Identify the different simple machines in everyday objects.</p> <p>To be aware of: The importance of the inventors who discovered or/and modified simple machines. The difficult process for inventing a machine. How to cooperate when working in pairs to build a compound machine.</p>	<p>to press, to move forward, to stand up, to turn, to move up, to move down, to move across, to go/move forward/backward.</p> <p>Adjectives: very, too, quite, rather, fairly, so, such, enough Adverbs: fast, slowly, here, there, above, everywhere, away, certainly, indeed, of course, perhaps, firstly, secondly, lastly, finally...</p>
<p>COGNITION</p> <p>Classifying objects depending on the simple machine: lever, inclined plane, wheel and axle, screw, pulley and wedge. Predicting the direction of the effort and the load. Matching definitions with meanings (simple machine, compound machine). Extracting the main information from the picture to order the text.</p>	<p>Language for learning</p> <p>Identifying/classifying</p> <ul style="list-style-type: none"> - It's a... - I/we found ... - We classified/our classification is... <p>Explaining</p> <ul style="list-style-type: none"> - It has... - It can... - It is used for... <p>Predictions/checking I/we think that the direction of the effort/force/ load will... I/we checked...</p> <p>Giving reasons Do you think...? Why? Because...</p>
<p>CULTURE</p> <p>Realize the importance of Archimedes theories in physics. Be aware of the different simple machines used in different countries and different periods of time. Identify simple and compound machines in their home and in the school. Simple machines are devices to make work easier.</p>	<p>Language through learning</p> <p>-Use of dictionaries for vocabulary extension -Questions that are raised in the sessions. -Language through activities and questions that are raised in the session.</p>

ASSESSMENT

Students should be able to:

- Name the different simple machines.
- Identify and classify different simple machines depending on their use and function.
- Identify the position and the direction of the effort and the load in simple machines.
- Cooperate when working in pairs/group.
- Understand the process of making machines depending on the purpose.