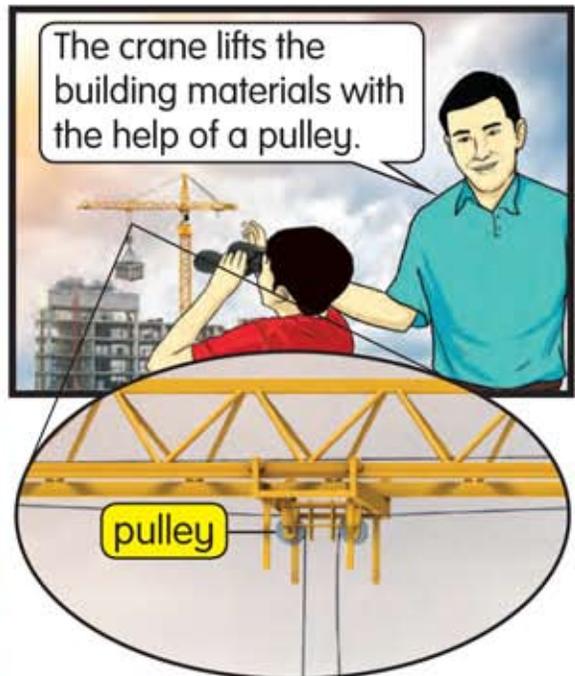


Lim and his father are chatting on the balcony of their house.



Where can you see pulleys other than in the situation above?

# Pulleys



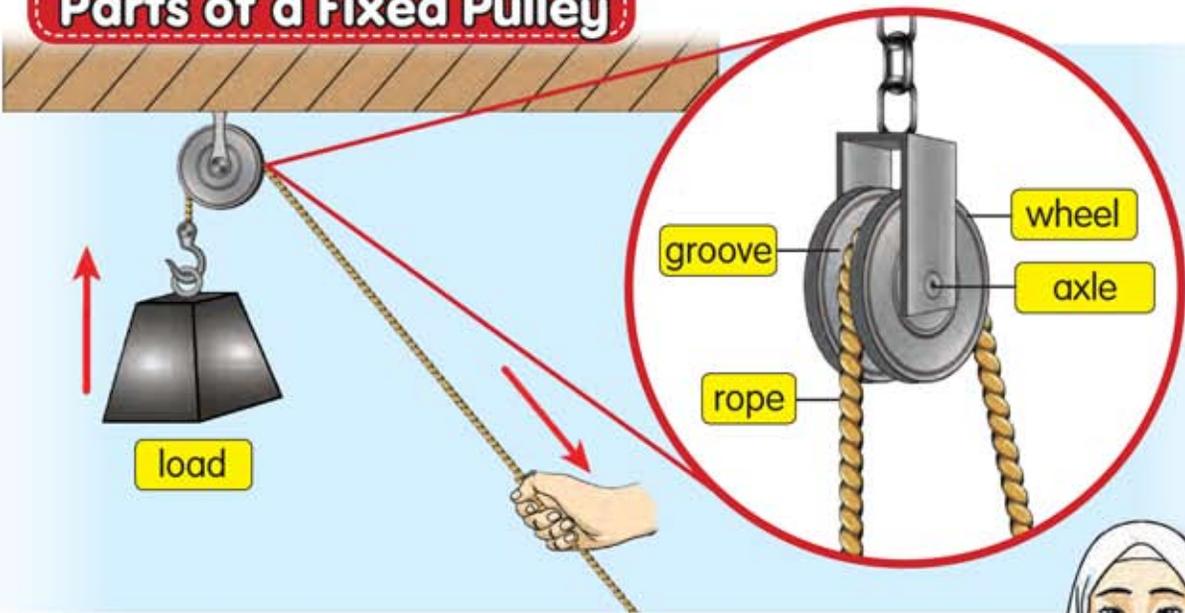
It moves using a pulley.

How does this cable car move?



**Pulley** is an example of a simple machine which enables load to be lifted easily using lesser force.

## Parts of a Fixed Pulley



A fixed pulley has a wheel with a groove that enables a rope to pass through it.

What is a pulley and its use?



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10.1.1

# The Functions of a Fixed Pulley

This is a crane model. It has a base, pole, arm, **pulley**, and rope. How does this model work?



The fixed pulley on the crane model works when all the components are connected. What are the components?



base



pole



arm



load



1 yellow pulley  
(acts as a motor)



rope



1 black pulley  
(acts as a fixed pulley)

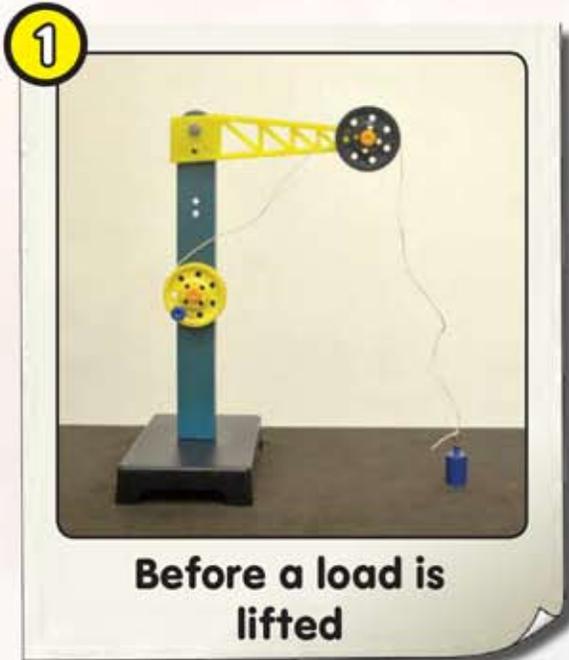


10.1.2

TEACHER'S NOTES

- Any suitable model other than the model shown can be used.

How does the fixed pulley work on the crane model?



When the rope is pulled, the load will be lifted upwards by the fixed pulley.



What about the pulley model you use in school? Explain how the pulley model works.

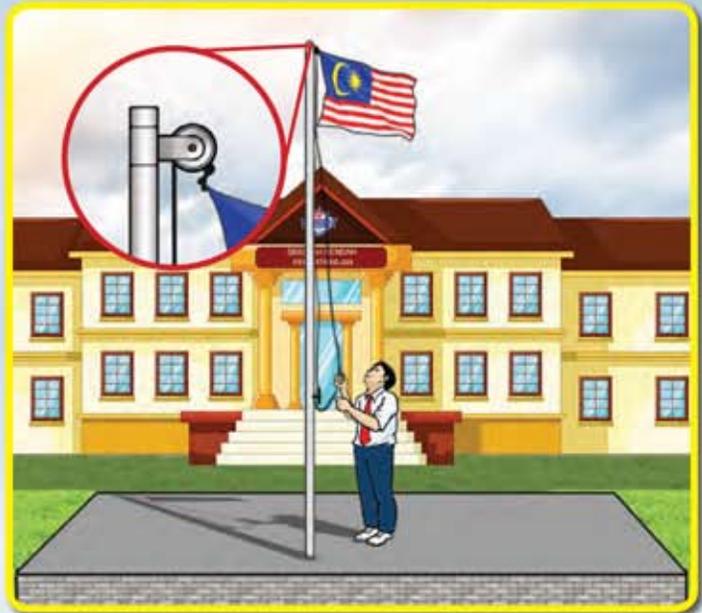
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# Uses of Pulleys

What are the examples of pulleys used in our life?

What will happen if the flagpole does not have a pulley?



What is the difference between lifting a bucket of water from the well using a pulley and without using a pulley? Which is easier? Why?





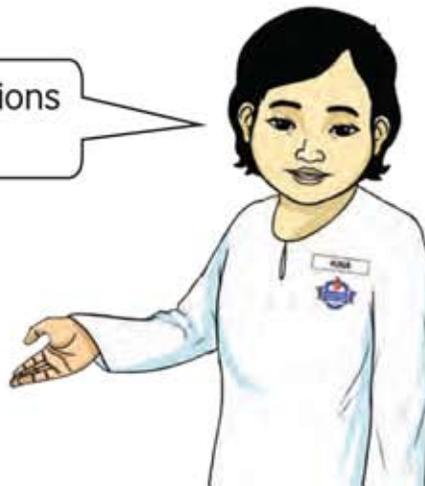
What will happen if the fishing nets are not pulled using a pulley?



What will happen if the heavy objects are lifted without using a pulley?



What are other applications of pulleys in our life?



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# Invent a Functioning Pulley Model

Pulleys make lifting load easier. How would you build a functioning pulley model to solve the problem of lifting loads?

## 1 Identifying the Problem

The residents of the apartment are carrying water from a lorry because the water supply has been cut off.



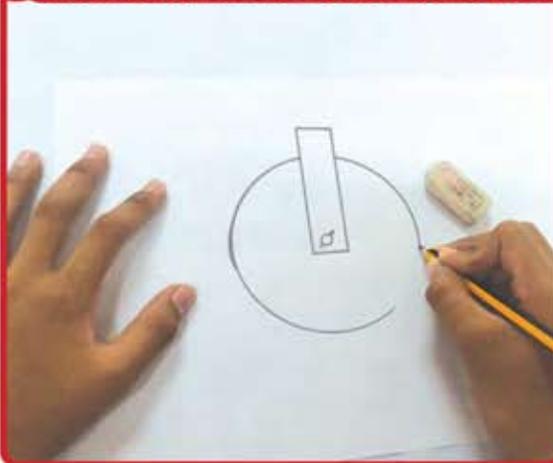
## 2 Generating an Idea

I suggest we make a pulley.

Let's build a functioning pulley model. We can use recycled materials.



## 3 Sketching Out Ideas



## 4 Preparing Apparatus and Materials



10.1.4  
10.1.5

### TEACHER'S NOTES

- A pulley model can be built according to pupils' creativity and is not limited to the example above.

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## 5 Building a Pulley Model



Measure, mark, and cut the box and the bottle.



Make a hole in the centre of the box.



Attach the parts of the box to the bottle that has been cut.



Insert a straw into the hole to make an axle.



Pierce the stick through the end of the straw.



Hang and test the completed pulley.

This pulley model has been used to produce a fixed pulley that can lift water to the upper floor.

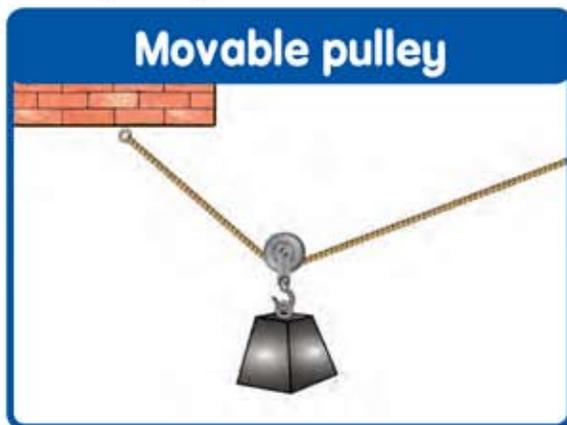
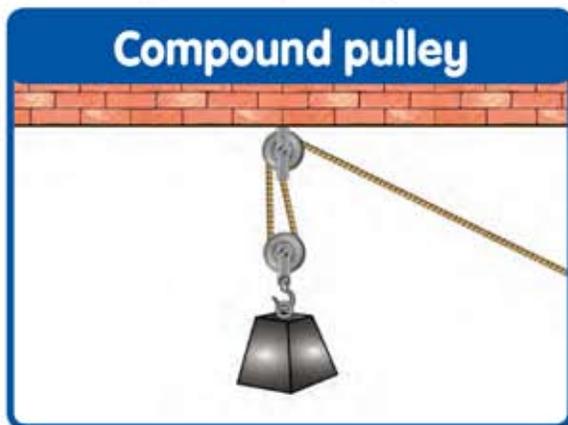


Build a workable pulley model in a creative way.



# Types of Pulleys

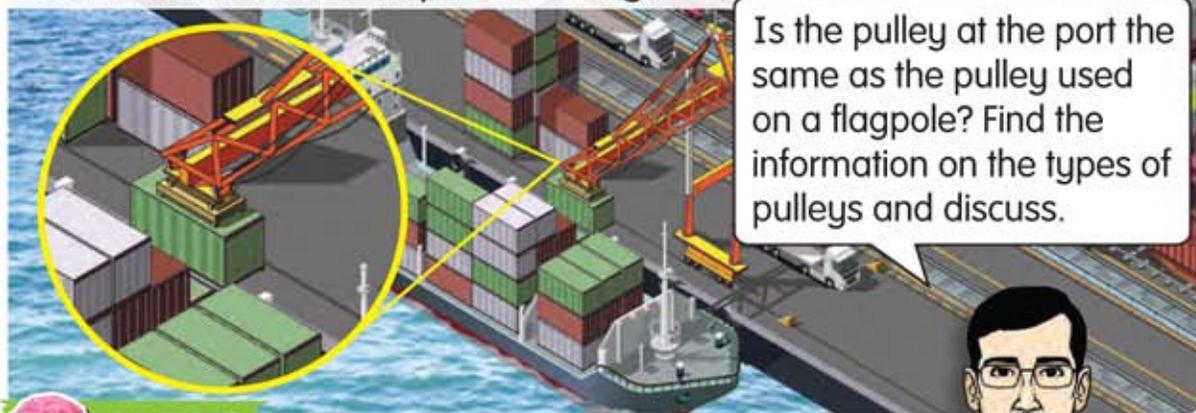
Besides the fixed pulley, there are several types of pulleys such as **compound pulleys** and **movable pulleys**.



Where can we find the use of these pulleys?  
Find information on the types of pulleys from various media.

## At the Port

A pulley on a crane makes it easier to unload a shipping container from the ship to the lorry.



### HOTS

How does the pulley move a heavy container from the ship to the lorry easily?



## At the Construction Site

A pulley on a crane makes lifting the building materials easier.



### HOTS

What will happen to the process of constructing a building if pulleys are not used?

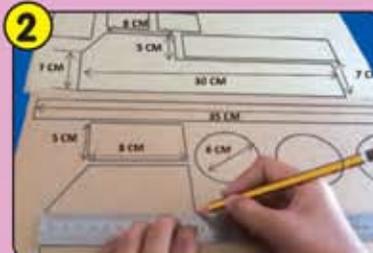


## Leisure Science

### My Crane Model

#### Steps

Build a crane model using recycled materials such as boxes and sticks.



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## Let's Remember

1. A pulley is a type of simple machine used to lift loads easily.
2. A fixed pulley contains several components:
  - (i) groove
  - (ii) wheel
  - (iii) rope
  - (iv) axle
3. A pulley functions when the rope is pulled through the groove to lift the load.
4. Besides fixed pulleys, there are other types of pulleys used to make work easier, such as pulleys used at construction sites and at ports.
5. Examples of the application of fixed pulleys in our life are:
  - (i) raising the flag
  - (ii) lifting water from a well
  - (iii) pulling up fishing nets
  - (iv) lifting building materials



## Let's Answer

Answer all the questions in the Science exercise book.

1. What is a pulley?
2. Name the parts of a pulley.
3. Based on Figure 1, explain how the load is lifted.

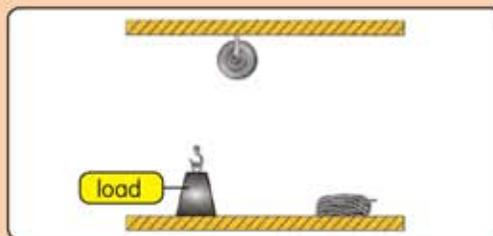
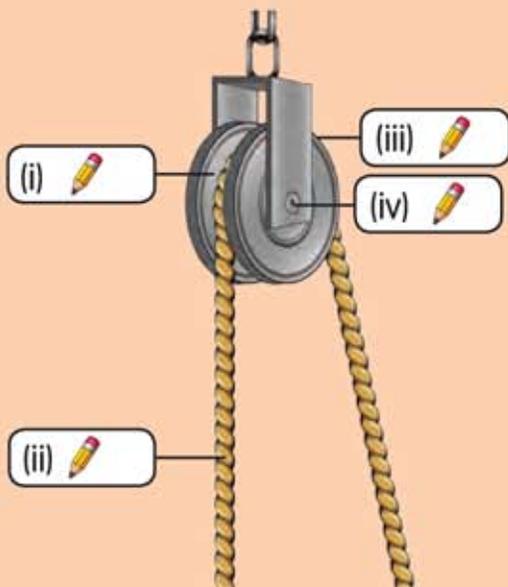


Figure 1

4. List two uses of pulleys in our daily activities.
5. State the functions of pulleys at the following places:
  - (i) construction site
  - (ii) port



# ANSWERS

## Unit 1: Scientific Skills

### HOTS suggested answer (page 7)

No, because the measuring tool used is different.

### Let's Answer (page 22)

- Sight, smell, taste, touch
- Animals with four legs, Animals with fur
- length
- Green or blue
- Not enough electrical energy, the dry cells are not fastened, bulb is damaged.
- graph
- (i) False (ii) True (iii) False (iv) True
- After completing a science investigation, we should clean, dry, and store away the science apparatus properly.

### HOTS suggested answer (page 22)

Advise my friend and tell him about the steps that should be taken when disposing of soil specimen, as the sink will be clogged if the soil specimen is thrown into it.

## Unit 2: Science Room Rules

### Let's Answer (page 28)

- Line up before entering the Science Room, do not eat in the Science Room, place all bags outside the Science Room, turn off the switches before leaving the Science Room, carry out activities in the teacher's presence.
- Not enough air and light may cause the activity to be carried out in an uncomfortable condition.
- No, because it will spoil the table top in the Science Room.
- (i) the hand lens and specimen will be damaged.  
(ii) the hand lens and specimen will not be damaged.
- Report to the teacher immediately.

### HOTS suggested answer (page 28)

These rules can be practised in other special rooms such as the resource centre, music room, computer room, RBT workshop, prayer room and others.

## Unit 3: Humans

### HOTS suggested answer (page 36)

Teeth would not last long. The number of teeth would not be enough for an adult. Teeth would be small and not strong.

### Let's Answer (pages 57-58)

- Incisors are for cutting food, canines are for tearing food, and molars are for grinding food into small pieces.
- (i) enamel (ii) dentine (iii) gum (iv) nerves (v) blood vessels

Milk Teeth Set	Permanent Teeth Set
There are 20 teeth: • 8 incisors • 4 canines • 8 molars	There are 32 teeth: • 8 incisors • 4 canines • 20 molars
Thin layers of enamel and dentine.	Hard layers of enamel and dentine.
Teeth are smaller and not strong.	Teeth are bigger and stronger.
Teeth are not permanent. They last for a short time.	Teeth are permanent. They last for a longer time.
Teeth start to grow at 6 months old and are complete at 3 years old.	Teeth start to grow at 6 years old and are complete at 21 years old.
Both sets have the same types of teeth, which are incisors, canines, and molars.	

- Rinse the mouth, brush the teeth or use floss.
- Protein - Fish, Carbohydrate - Bread
- To keep the body warm
- ✓ Papaya ✓ Tomatoes
- (i) Yes (ii) This is because *nasi lemak* contains all the food classes from every level of the Malaysian Food Pyramid.
- A balanced diet helps to keep our bodies healthy.
- Digestion is a process to break down food into small parts so that the nutrients from food are easily absorbed by the body.
- P - Mouth, Q - Oesophagus, R - Stomach, S - Intestine, T - Anus
- It will be removed from the body through the anus as faeces.
- (ii) eating in the park.

### HOTS suggested answer (page 58)

Because the body's requirement for each food class is different depending on age, sex, occupation, and health condition of a person.

## Unit 4: Animals

### HOTS suggested answer (page 64)

Not all omnivores have the same set of teeth because certain omnivores do not have teeth, such as chickens and doves.

### Let's Answer (page 70)

- (i) Omnivore because bat eats fruits and insects  
(ii) Carnivore because frog eats other animals only  
(iii) Herbivore because cow eats plants only
- (i) goats and rabbits (ii) eagles and tigers (iii) chickens and monkeys
- (i) Other animals (ii) plants  
(iii) Other animals and plants

- (i) lions and wolves (ii) orangutans and chimpanzees (iii) giraffes and goats
- Incisors to cut food and molars to grind food into small pieces.

### HOTS suggested answer (page 70)

Animals would adapt to their environment by looking for sources of food that can be eaten for their survival.

## Unit 5: Plants

### Let's Answer (page 78)

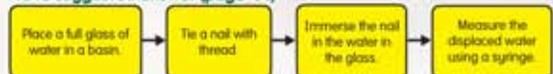
- (a) (i) stem cutting (ii) underground stems (iii) spores  
(b) (i) tapioca (ii) ginger (iii) ferns
- The reproduction of plants is important for life so that food sources, habitat, oxygen, and supply of wood will be conserved and will always be available.
- Water spinach and sweet potato
- Orchids and bananas

## Unit 6: Measurement

### Let's Answer (page 94)

- (i) two square centimetres (ii) ten cubic centimetres
- graph, squares
- 7 cm<sup>2</sup>
- (i) 10 m<sup>2</sup> (ii) 30 m<sup>2</sup>
- (i) 12 cm<sup>3</sup> (ii) 27 cm<sup>3</sup>
- Wastage or not enough files

### HOTS suggested answer (page 94)



## Unit 7: Density

### Let's Answer (page 104)

- apple and quill
- more
- float, less
- A life jacket will float on the surface of the water because it is less dense than water, so it can prevent someone from drowning.

### HOTS suggested answer (page 104)

Peel the skin of the orange.

## Unit 8: Acid and Alkali

### HOTS suggested answer (page 106)

No, because the litmus paper needs to be moist before testing a dry substance. A liquid substance needs to be dropped onto the litmus paper.

### Let's Answer (page 114)

- litmus paper
- (i) Property of X - Neutral ; Property of Y - Alkaline ; Property of Z - Acidic  
(ii) Substance X - Drinking water ; Substance Y - Soap ; Substance Z - Lemon juice
- turmeric, purple cabbage, hibiscus
- Taste and touch cannot be a scientific indicator because most bitter substances that are slippery when touched are alkaline. However, bitter gourd is acidic as it changes litmus paper from blue to red.

### HOTS suggested answer (page 114)

Toothpaste can neutralise acid in the mouth.

## Unit 9: The Solar System

### HOTS suggested answer (page 121)

The Earth would no longer be suitable for life because it would be too cold.

### HOTS suggested answer (page 124)

Mercury and Venus take less than one Earth Year to revolve around the Sun, whereas Mars, Jupiter, Saturn, Uranus, and Neptune take longer than one Earth Year.

### Let's Answer (page 126)

- Third 4. Sun
- Asteroid 5. Neptune, Saturn, Jupiter, Earth, and Venus
- Neptune 6. Mercury, because its orbit is the smallest.

## Unit 10: Machine

### HOTS suggested answer (page 135)

The pulley on the crane of the port can lift up a heavy shipping container using lesser force. Therefore, the heavy shipping container can be moved from the ship to the lorry easily.

### HOTS suggested answer (page 136)

The process of constructing a building without the use of pulleys will take a longer time and need more workers.

### Let's Answer (page 137)

- A pulley is a simple machine that makes the lifting of loads easier using a lesser force.
- (i) groove (ii) rope (iii) wheel (iv) axle
- The load can be lifted when the connected rope is pulled through the groove. When the rope is pulled, the wheel turns and the load is lifted upwards.
- Raise a flag, lift a bucket of water from a well, pull the fishing nets
- (i) lifting construction materials (ii) easing the unloading of a shipping container