Ministry of Education, Youth and Information

Primary Exit Profile (PEP 5)

June 2019

Science

Time: 1 hour 30 minutes

PLACE LABEL HERE

Name of Student
Name of School
Name of Class

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General Instructions:

This task has three parts: Part 1, Part 2, and Part 3.

Part 1 has three questions, Part 2 has two questions and Part 3 has one question. You are to answer all six questions.

Instructions to begin:

Carefully read the introduction to the task then move on.

NOTE:
Use the ruler provided to complete question 4 in Part 2.

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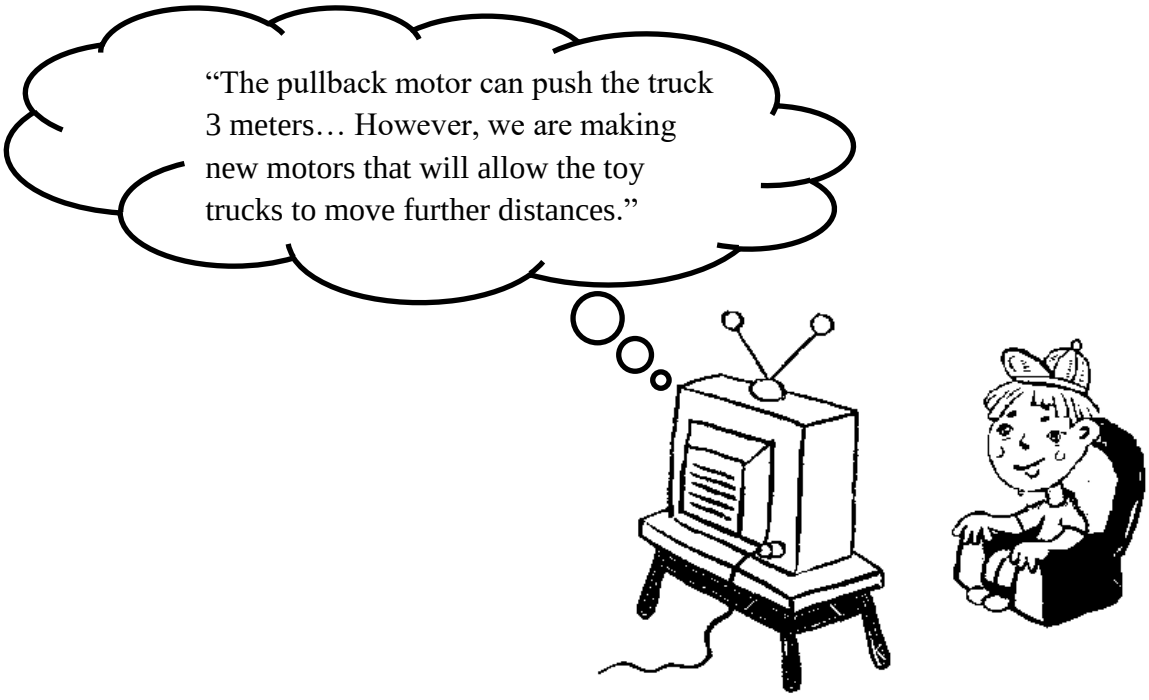
Introduction to Task

Curious Tim's Investigation

Tim was watching "Tech Alert" one of his favourite television shows when he saw a report on a pullback toy truck. The truck would move forward when you pull it backwards. The toy truck had a pullback motor that **provided the pushing force to move the truck forward**.



After watching the show, Tim asked the following question:

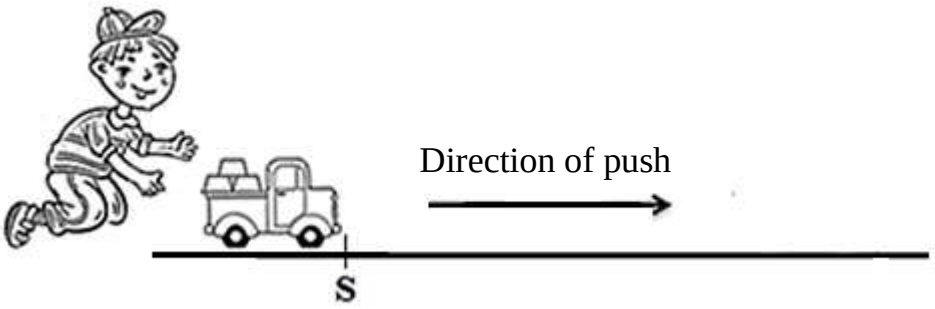
Will the new pullback motor produce a greater pushing force and is that why the toy trucks can move a further distance?

Part 1: Planning the fair test

In order to answer his question Tim wanted to plan a fair test. In his fair test he wanted to find out how the size of different pushing forces would affect the distance an object moves. Tim planned to:

- put **three** blocks on a toy truck
- push the toy truck using different size forces
- measure the distance the toy truck would move after each push

Diagram showing the setup of Tim's Investigation



1. Tim wrote the following steps to use when carrying out his fair test. **ONE** step is incorrect. Circle the step that should be rewritten so that his investigation represents a fair test.

A. **Step 1** Mark a point on the ground and call this point "**S**"

B. **Step 2** Push a toy truck from "S" using a **strong force** and measure how far it moves from point "S"

C. **Step 3** Push the same toy truck from "S" using a **medium force** and measure how far it moves from point "S"

D. **Step 4** Push a different toy truck from "S" using a **weak force** and measure how far it moves from point "S"

2. For the incorrect step you identified in **question 1**, rewrite the step so that his investigation will represent a fair test.

Tim is concerned about the accuracy of the measurements he would gather at the end of his investigation.

3. What should Tim do if he wants to improve the accuracy of the results he will gather at the end of his fair test? Circle the correct answer.

A. measure more than once, the distance the toy truck will move when pushed with the same size force

B. use a centimetre ruler to measure the distance the toy truck will move

C. countdown each time before pushing the toy truck with a different size force

D. push the toy truck on a smooth surface

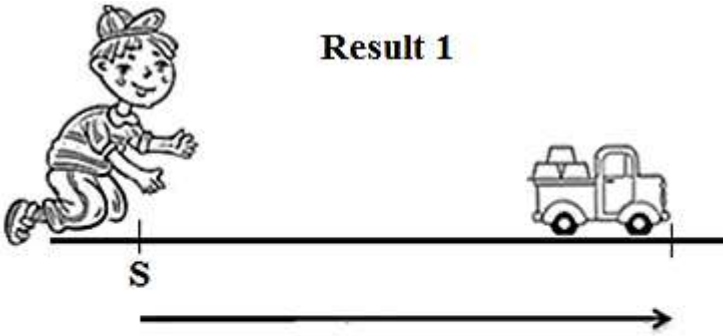
Part 2: Gathering the Results

4. The drawings below show the results of Tim's fair test. Use them to complete the information in the boxes to the right of each drawing.

You need to help Tim gather his results by:

- measuring and recording the **length of the arrow** in cm using the ruler provided (this is the **Drawing distance**);
- calculating the **Actual distance** moved by the toy truck.

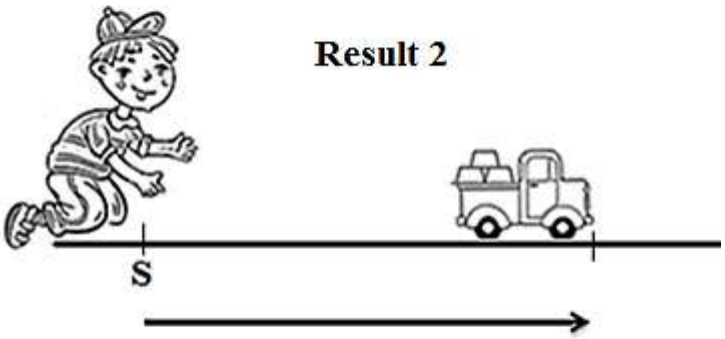
NOTE: the Actual distance moved is 100 times the Drawing distance.



Pushing force = Strong

Drawing distance (cm) =

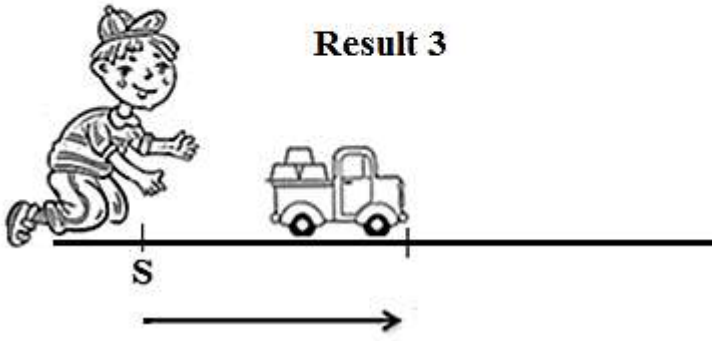
Actual distance (cm) =



Pushing force = Medium

Drawing distance (cm) =

Actual distance (cm) =



Pushing force = Weak

Drawing distance (cm) =

Actual distance (cm) =

5. The table shown below was created by Tim. Complete the table using the information gathered from the drawings **in question 4**.

The table **must** display the following information:

- mass of blocks on the truck in each result
- actual distance travelled by the truck in each result
- row and column labels

NOTE: the mass of each block was 50 g

Table showing the distance travelled by toy truck when pushed with different size forces

	Pushing Force Applied	_____	**Actual Distance**
Result 1	strong	_____	_____
_____	_____	_____	_____
_____	weak	150 g	_____

Part 3: Making Sense of the Results

Below is the question Tim asked. Read Tim's question before continuing to question 6.

Tim's question: Will the new pullback motor produce a greater pushing force and is that why the toy trucks can move a further distance?

6. Do the results of the investigation answer the question Tim asked?
Use the results observed in the table in question 5 to support your answer.