

Working in a Spacesuit

Take the challenge! Make yourself a spacesuit, then see how well you can work without the suit compared with wearing the suit.

Question

How well can you carry out different tasks while wearing a spacesuit?

Safety Precautions



- Take care using scissors.

Apparatus

- clock or stopwatch
- scissors
- pair of hockey gloves or oven mitts
- school bag or backpack with zipper
- CD or DVD in hard plastic case
- jar with screw-top lid filled with dry macaroni
- pen or pencil
- woollen socks
- pull-on boots or shoes

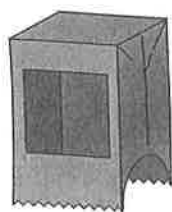
Materials

- 6 2 L empty milk or juice cartons
- duct tape
- 3 sheets of paper
- Ziploc™ bag
- brown paper grocery bag

Procedure

Making a Space Helmet

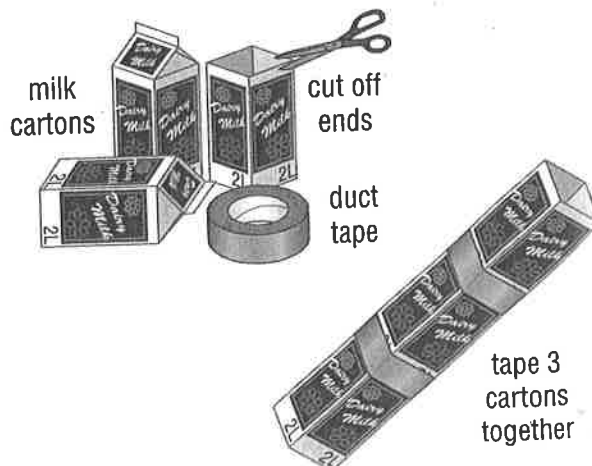
- 1 Cut an 18 cm × 10 cm rectangle out of the middle of one side of a brown paper bag.
- 2 Cut a semicircular piece from opposite sides of the top of the bag so that the bag will fit around the shoulders when placed over the head.



paper bag helmet

Making Spacesuit Arms

- 3 Cut off both ends of the milk cartons.
- 4 Join three cartons together with duct tape for each arm. Put your arms and helmet in a safe place.



Preparing the Challenge

- 5 Place the jar of macaroni, Ziploc™ bag, sheets of paper, pen or pencil, socks, boots, and CD or DVD in the school bag and close the zipper.
- 6 Prepare a data table to record the results of the five tasks described below.

Skill

POWER

For tips on making a data table, turn to SkillPower 5.

Taking the Challenge

- 7 Working with a partner, carry out all five tasks (see below). **Record** the time it takes to complete all the activities.

Task 1	Remove all the contents of the school bag.
Task 2	Remove the CD or DVD from its case and exchange it with your partner's. Place your partner's CD or DVD in your case.
Task 3	Pour the macaroni from the jar into the Ziploc™ bag. Seal the bag. If any macaroni spills, you must pick it up and place it in the Ziploc™ bag.
Task 4	Write your name on one sheet of paper. Fold the paper in half.
Task 5	Put on the socks and boots.

- 8 Repeat step 5.
- 9 Put on the space helmet, spacesuit arms, and space gloves (the hockey gloves or oven mitts).
- 10 Repeat all five tasks. **Record** the time it takes.

Analyze

1. How long did it take you to complete the challenge during each trial?
2. Which tasks were most difficult to carry out when you were wearing a spacesuit?
3. How did having a partner help you or make tasks more difficult?

Conclude and Apply

4. What recommendations would you make to help an astronaut carry out tasks more efficiently?
5. How do you think astronauts hold and grip tools?

Extend Your Skills

6. Draw a design of a spacesuit including features that would make it easier for an astronaut to collect rock samples. Label your design.

Name: _____
 Classroom # _____
 Div. _____

Working in a Spacesuit

Use this table to record your data for Science 6 Experiment 7 – J, pp. 212-213.

Follow the instructions for steps 1-6 and 8-9 of the experiment. Use the table to record your times for steps 7 and 10.

Task	Description	Time: Step 7	Time: Step 10
Task 1	Remove all the contents of the school bag		
Task 2	Set 2 CDs in jewel cases out. Remove the CD or DVD from its case and exchange it with your partner's. Place your partner's CD in your case.		
Task 3	Pour the macaroni from the jar into the Ziploc bag. Seal the bag. If any of the macaroni pills, you must pick it up and place it in the Ziploc.		
Task 4	Write your name on one sheet of paper. Fold the paper in half.		
Task 5	Put on the socks and boots.		
Total time:			

Name: _____
classroom # _____

Lab # _____
Title: _____

Hypothesis: _____ ?

Prediction: If we _____
then _____

Materials: _____

Procedure:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____...

Results:

We observed that _____

Conclusions:
Our experiment worked / did not work because _____

Next time we would _____

The experiment applies to real life because _____
