SCIENCE

Lessons 18–19

Year 4

Topic: Testing games

Hosting a *60-second slam* (2)

Today you will:

- collect data and evaluate forces games by observing and playing games within a game show.

Resources

Digital

Learning object — Graph Maker 2

Find and prepare

Paper or plastic cup	Two sheets of A4 paper	Marble
Ruler	Small bin or box	Sticky tape
Masking tape	Tennis ball or similar bouncy ball	Three empty plastic drink bottles
Toy car	Stopwatch	Exercise book

Key terms

For definitions and explanations of terms, please see the Glossary.

Lesson

Game show producers



The producers of the exciting and fun game show *60-second slam* were very impressed with your new game.

We would now like you to test some of the new game designs for us. We need to know that the game is difficult but not impossible. You will test five of our finalist game designs and rank them according to how difficult they are.

Once the difficulty of the games has been evaluated, you could host your own slam show with your friends and family. You will need to introduce the game, its rules and explain the forces in the game. It will be fun to see who has the skill to be the winner of your own *60-second slam*!

Organise the evaluation

1. Collect the materials and follow the instructions to play ‘Rolling racer’.

Rolling racer

Equipment

Paper or plastic cup

Ruler

Masking tape

Toy car

Method

- Place cup on its side.
- Measure 1 m from the opening of the cup to the starting line.
- Mark the starting line with the masking tape.
- Put the toy car on the starting line.
- Pull back on the car and apply a pushing force to propel it into the paper cup.
- You must not apply a pushing force beyond the starting line.
- Count how many attempts it takes to get the car into the cup in one minute.
- You have 60 seconds to complete the task.

Optional: Try different surfaces (carpet, linoleum, concrete or grass) or different distances to change the game.

2. Answer the following questions about the game ‘Rolling racer’.

   a. What was the main force involved in this game?

   b. Was the game successfully completed in the 60 seconds? Yes ☐ No ☐

   c. How many attempts did it take to successfully complete the challenge?

3. Collect the materials and follow the instructions to play ‘Paper plane duo flight’.

Paper plane duo flight

Equipment

Two identical paper planes (see instructions on making plane below)

Ruler

Stopwatch

Method

- Hold a paper plane in each hand and launch them simultaneously with a pushing force.
- The planes must travel more than 1 m from the launch position.
- The planes must fly together and land next to each other (no more than 30 cm apart).
- Count how many attempts it takes to get the planes to land together in 60 seconds.
- You have a minute to complete the task.

How to make a paper plane

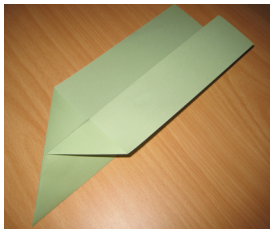
1. Fold one A4 sheet of paper in half lengthwise.



2. Fold the top left corner to the centre fold. Repeat for the top right corner.



3. Close the paper with flaps on the inside. Make wings by folding short side down to long side.



4. Answer the following questions about the game ‘Paper plane duo flight’.

   a. What was the main force involved in this game?

   b. Was the game successfully completed in the 60 seconds? Yes ☐ No ☐

   c. How many attempts did it take to successfully complete the challenge?

5. Collect the materials and follow the instructions to play ‘Tennis ball bin bounce’.

Tennis ball bin bounce

Equipment

Small bin (or box)

Tennis ball (or similar bouncy ball)

Ruler

Stopwatch

Method

- Stand 2 m from the bin/box
- Bounce the ball into the bin.
- The ball must bounce off the floor at least once before it goes into the bin. (You cannot just throw the ball into the bin.)
- Count how many attempts it takes to get the ball into the bin in 60 seconds.
- You have a minute to complete the task.

Optional: To change the game, try bouncing the ball on different surfaces (concrete, carpet, linoleum or grass) and from different distances.

6. Answer the following questions about the game ‘Tennis ball bin bounce’.
   a. What was the main force involved in this game?

   b. Was the game successfully completed in the 60 seconds? Yes ☐ No ☐

   c. How many attempts did it take to successfully complete the challenge?

7. Collect the materials and follow the instructions to play ‘Sticky tape roll’.

Sticky tape roll

Equipment

Marble Sticky tape

Ruler Masking tape

Stopwatch

Method

- Place the marble in the centre of a table or other smooth surface.
- Measure a distance of 50 cm from the marble and mark a starting line with masking tape.
- Put the sticky tape on its curved side on the starting line.
- Apply a pushing force to the sticky tape so it rolls across the table and hits the marble.
- The sticky tape must make the marble start to roll.
- The pushing force must not be applied beyond the starting line.
- Count how many attempts it takes to get the sticky tape to hit the marble in 60 seconds.
- You have a minute to complete the task.





8. Answer the following questions about the game ‘Sticky tape roll’.

   a. What was the main force involved in this game?

   b. Was the game successfully completed in the 60 seconds? Yes ☐ No ☐

   c. How many attempts did it take to successfully complete the challenge?

9. Collect the materials and follow the instructions to play ‘Bottle bowls’.

Bottle bowls

Equipment

Three empty plastic drink bottles

Tennis ball (or similar ball)

Ruler

Stopwatch

Method

- Line up the three bottles next to each other, 5 cm apart.
- Stand 2 m from the bottles.
- Roll the ball to knock over the centre bottle only.
- The other bottles must not fall over.
- Count how many attempts it takes to knock the bottle over in 60 seconds.



10. Answer the following questions about the game ‘Bottle bowls’.

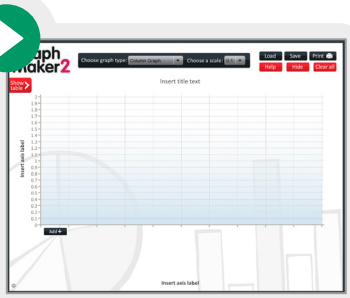
a. What was the main force involved in this game?

b. Was the game successfully completed in the 60 seconds? Yes ☐ No ☐

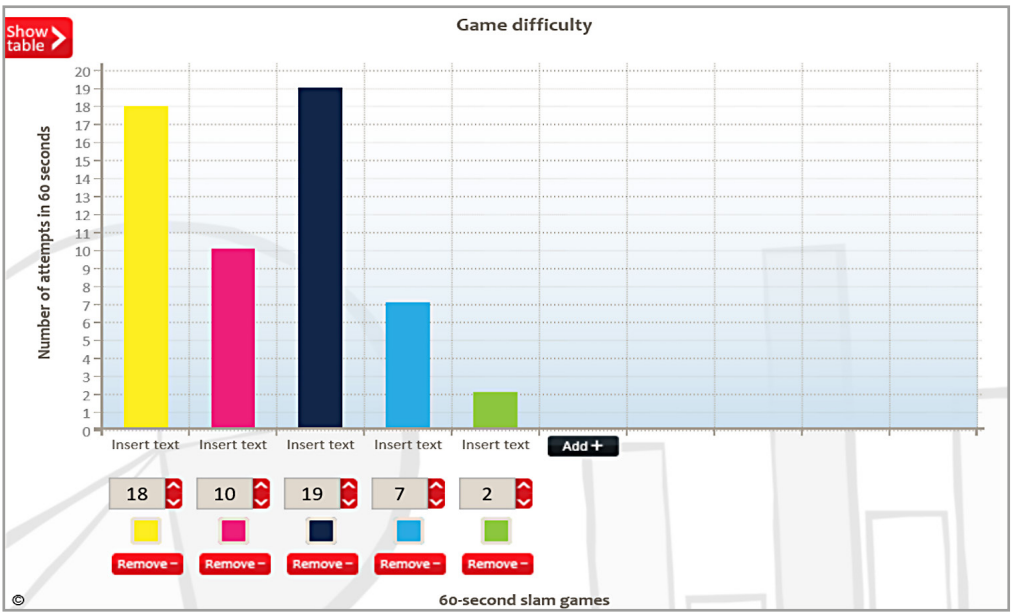
c. How many attempts did it take to successfully complete the challenge?

Review the games in the show

11. Use your collected data to make a graph showing the results. Enter the number of attempts, within 60 seconds for each of the games, into a graph. You can draw one in your exercise book or use **Learning object — Graph maker 2**.



Here is an example of how you can present your results in a graph.



12. Answer the following questions about the *60-second slam* games. Write your answers or discuss them with another person.

    a. According to your results, which game was the most difficult to play?

    b. According to your results, which game was the easiest to play?

c. Were there any games that were impossible to play?

d. Did you notice any relationship between the difficulty of the games and the main forces involved in the games?

e. Write any improvements that could be made to any of the games.

Play *60-second slam* (optional)

Now it's time to host your own *60-second slam* with your friends and family. Invite some of your friends and family to compete in a friendly *60-second slam* competition.

Organise the games in order of easiest to hardest. Contestants take turns to complete the easiest game. The contestants who successfully complete the game move on to the slightly harder game.



13. Organise the competition.
    a. Set up the equipment for each of the games in order from easiest game to hardest.
    b. Gather your contestants around the easiest game.
    c. Introduce the game, its rules and the forces involved in the game.
    d. Start your stopwatch and see which contestants can complete the game in the *60-second slam!*

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