

## 'Simple' Challenges

Many science game activities can be utilised into an effective challenge activity for your Group. The challenges are designed as team challenges some with time limits. Others can be stand alone programme inserts or part of the overall evening challenge.

### Preparation

In order for this activity to be successful it will be necessary to compile and have available the relevant materials in quantity for the teams to use. In compiling this equipment you will have to imagine in a number of cases what the teams may come up with as a solution to the problem and anticipate the equipment needed.

### The Challenges

1. Make a beam with a span as wide as possible which, when supported ( but Not Fixed) at each end, will support a weight at its mid - point.

#### *Materials*

One sheet of thin card, one roll of sticky tape, scissors, a 250 gram. weight.

2. Support a drinking glass on a bridge made from a five pound note.

#### *Materials*

Three drinking glasses of the same size, a crisp new five pound note

3. Use one tabloid newspaper to build a bridge that will span one metre and hold the largest load possible. You have 25 minutes.

#### *Materials*

Newspaper, paper clips, staples, glue, scissors, objects of varying weights.

4. In 20 minutes, build the highest possible tower using all the cards.

#### *Materials*

A full pack of playing cards.

5. Construct a structure or mechanism that will carry a marble over the greatest horizontal distance before it comes to rest.

#### *Materials*

Two sheets of card, 100 paper clips, 10 drinking straws. 40 pins, one marble.

6. Build a free standing structure that will support a OXO cube as far out as possible from the edge of a table without touching the floor.

#### *Materials*

50 drinking straws, 40 pins, one OXO cube.

7. Build a device within an area 25 cm X 25 cm that will allow your entire team to stand 60cms off the floor at the same time.

*Materials*

six spars, rope

8. Build a raft able to hold the largest mass without sinking. You may use as many sheets of paper as you like, but may not cut them to make them smaller. After 10 minutes construction time, you will put your rafts to the test by floating them. You may not test designs in water before the final float test.

*Materials*

A stack of sheets of paper all the same size, a supply of marbles or pennies and a basin of water for the testing.

9. Invent a device to : -

- 🦋 weigh a wild bird without causing it any harm.
- 🦋 enlarge a diagram
- 🦋 measure the growth of a plant over a period of one week.
- 🦋 Invent a musical instrument - percussion, stringed, or wind. Play a little tune on it. Put together a band.

*Material*

Bottles, tins, water, elastic bands , dried peas.

10. In 20 minutes, build a free standing tower that will hold a marble one metre above the floor.

*Material*

tape, drinking straws, scissors, marble, elastic bands, paper clips.

11. Design and make a simple mirror system that will allow you to trim your hair without going through great contortions.

12. Design and construct a vertical 'Adventure Playground' for a marble. The aim is to produce a system of interesting devices or events that will delay the marble's descent from one metre without the application of external power. The winning device will be the one that delays the marble's descent the longest and includes the greatest number of devices.

*Material*

A base board 30 cm X 1 m, craft sticks, pieces of cardboard, pins, odds and ends, a marble.

13. Use a warming candle to provide power to a mechanical device that will move an object a distance of one metre.

14. Figure out how to drop a slip of paper and a 10p coin from the same height at the same time so that they reach the floor at the same time.

*Material*

a sheet of paper, a 10p coin, scissors.

15. Make a paper helicopter that will take the longest time to fall to the ground from a height of 3 metres.

*Material*

Sheets of paper, tape, scissors.

16. Put a piece of paper underwater without getting it wet.

*Material*

Sheets of paper, a drinking glass, a pail of water.

17. Construct a device that will propel itself along the floor.

*Material*

Craft sticks, twigs, tape, glue, pins, elastic band.

18. From any household items, build a gadget with as many moving parts as possible that will successfully perform as an alarm clock.

*Material*

A stockpile of candles, elastic bands, tin cans, thread spools, and other odds and ends.

19. With the fewest drinking straws possible, build a framework that will support a cup full of water at least 5 cms off the ground. You have 25 minutes. You can test your frame as you go, but only on half a cup of water.

*Material*

Drinking straws, pins, elastic bands, tape, paper clips, scissors, plastic cup with drinking straw through the top ( just below the rim, punch hole on opposite sides of the cup and slip in a drinking straw).