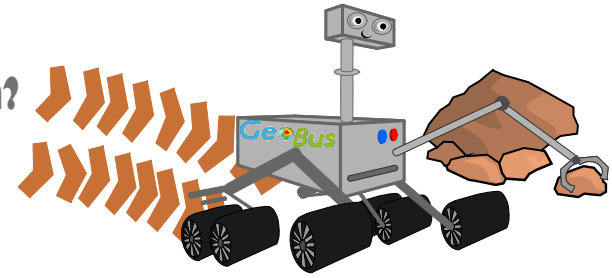
Science Fact or Fiction?

Activity List



Potato Power: *using the energy of a potato to power a light bulb/clock*

Information: This activity follows on from the 'Surviving on Potatoes' film clip [00:20:38 – 00:21:34] and demonstrates the energy contained within a potato by hooking it up to a light bulb (or clock) as the 'battery'.

See also: https://goo.gl/knEgxy

Time required: 15-20 minutes

Potato Calories: *calculating the calorific content of an average potato*

Information: This activity also follows on from the 'Surviving on Potatoes' film clip [00:20:38 – 00:21:34] and involves estimating the equivalent calorific content in different foods [1], measuring the calorific content of a potato [2] and calculating how many potatoes an average person would need to eat to survive for the same length of time Mark Watney managed to on Mars [3].

See also: *http://www.calorificapp.com/* (examples of 200 calories)

Time required: [1] 10 mins

[2] 20-30 mins

[3] 5-10 mins

Salty Soil: *demonstrating the influence of salt on the freezing point of water*

Information: This activity follows on from the 'Making Water' film clip [00:24:37 – 00:28:00] and involves using food colouring to identify the different melting patterns in fresh water ice vs. salt water ice – highlighting that salt can lower the freezing point and hence salts in the martian soil may mean conditions allow for liquid water at the surface.

Time required: [NEED TIME FOR ICE TO FREEZE – ideally overnight]

10-15 minutes

Extracting water: *demonstrating the removal of moisture from soil using energy*

Information: This activity also follows on from the 'Making Water' film clip [00:24:37 – 00:28:00]. It uses a microwave to demonstrate that heating soil (particularly during the efficient addition of energy in the form of microwaves) can release moisture.

Note: This activity requires a microwave so it may be better carried out in small groups, or given as a homework/extra credit exercise?

Time required: 5-10 minutes (longer if repeating with multiple soils)

UK SPACE AGENCY

GeoBus

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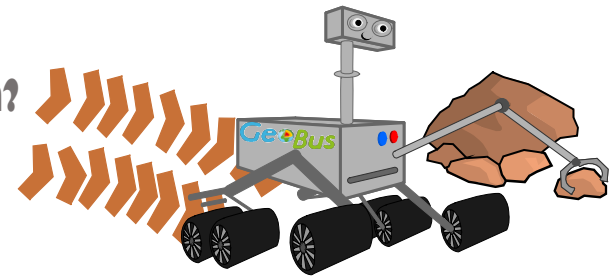

Other suggested activities

Rocket Launch: *how aerodynamics/launch angle control speed/distance travelled*

Information: This activity follows on from the 'Windowless launch' film clip [01:45:08 – 01:45:50]. Effective matchbox rockets can be easily built following the steps in the video below – modify the design using small amounts of cardboard and tape to create rockets with different 'bodies' [**note that a clear 3-4cm at the top of the rocket is required to ensure it doesn't catch fire rather than launching!**].

Safety note: Rockets should be launched outside and care should be taken that they are not aimed at people or animals. Once launched the rockets will be hot, so care should also be taken retrieving them.

Instruction link: https://www.youtube.com/watch?v=WFyKqmnCF-8

Instruction steps:

1. Trim the point of a wooden skewer so there is still a narrowing, but it is no longer sharp, and cut to approx. 15cm long
2. Cut a rectangle, about 5cm by 15cm, of aluminium foil
3. Lay the skewer across the foil, so that the point is 2/3rd across
4. Cut the head off a matchstick and place at the end of the skewer
5. Roll the foil tightly around the skewer + matchstick head
6. At the end with the matchstick head, tightly squeeze flat and fold down the excess foil, then crimp (with pliers) to ensure a seal
7. Design rocket how you'd like (make fins, wings, windows etc.) but take care not to make any holes in the foil
8. Make a stable stand with a hole to place the free end of the skewer in
9. [OUTDOORS] Place the rocket on its skewer in the stand
10. Light a tea light underneath the rocket head & step back … wait for the launch!

Moving to Mars: *estate agency challenge*

Consider the challenges that would need to be overcome for humans to settle on Mars – who would be up for being the first to go? What are the pros and cons, and what home comforts would make the difference? Challenge pupils to work in groups to think about these factors and try to create an estate agency advert (or video) selling a place on Mars.

Don't forget you might need to bring;

- a high tolerance for cold, loneliness and radiation
- lifetime supply of breathable air and food
- multibillion pound spaceship
- a desire to just get away from it all
- water
- tolerance to dust