CRESS HEADS

Wondering what to do with all those leftover egg shells from your boiled eggs and omelettes? Look no further…

YOU WILL NEED

Egg shells
Water
Tissue or Cotton Wool
Cress seeds

WHAT TO DO

1. First, prepare your eggshells. When you're cooking and eating them, try to crack them towards the top, leaving as much as possible un-cracked at the bottom. That way you get a more head-shaped bit of egg to play with. Now carefully clean the inside out if there are any eggy bits left inside.

2. Cut the tissue up into small squares so that you can put it inside the egg without cracking the shell. It's even easier to use cotton wool as it won't need cutting. Fill the egg up to about 1cm below the rim of the egg shell.

3. Moisten the tissue/cotton wool thoroughly – right the way through.

4. Cover tissue/cotton wool with a layer of seeds (not more than one seed thick!). Place the eggs in the light. And don't forget to water them when they get dry.

5. Once the seeds have started growing, draw a funny face onto the shells and watch as the cress hair grows.

6. When the cress is fully grown, you can chop it off and use it in egg sandwiches… (Or try Jamie Oliver's 'Potatoes, Avocado and Cress Salad' – you can look it up online!)

While you're munching, here's some seedy science to get your teeth into!

SEEDS: THE INSIDE STORY

The outer covering of a seed is called the seed coat. And inside the seed is the 'embryo' and 'endosperm'. The seed coat helps to protect the embryo from injury and also from drying out. Seed coats can be thin and soft as in beans, or thick and hard like a coconut seed. Cress seeds are tiny, but their coats are quite tough.

The endosperm is a temporary food supply for the developing plant. It's packed around the embryo in the form of special leaves called 'cotyledons' or seed leaves. These generally are the first parts visible when the seed germinates.

Plants are classified based on the number of seed leaves in the seed. Plants such as grasses can be monocots (i.e containing one seed leaf). Dicots are plants that have two seed leaves. Cress is a dicot.

HOW SEEDS GROW

The first stage of germination is the absorption of water by the seed. This softens the seed coat and causes cells in the embryo inside to enlarge so that the embryo can break open the seed.

Next the root emerges out of the seed. The root provides anchorage and allows the seed to draw up more water, which is needed for the continued growth of the seedling.

The stem then pushes up through the soil/cotton wool. Once it's above the ground and in the light, the stem straightens out, the leaves expand and they begin to make chlorophyll. The cotyledons have provided most of the food and energy for the growth during germination, but now with the leaves expanded photosynthesis can take over the role of providing food for continued growth. The cotyledons, having had most of their food used up, have served their main purpose. They now wither, die and fall off.

WANT TO INVESTIGATE FURTHER?

Here are some experiments you can carry out for yourself:

- Try growing the seeds in a dark room
- Try growing them under different coloured lights.
- Try growing them with different amounts of water
- Try growing them at different temperatures.

There are two more activities you can try in the Planet Science Little Book of Experiments. Click to http://www.planet-science.com/experiment and search for 'Light Fantastic' and 'Mini Water World' in the Teachers section.

MEXICAN FOIL JUMPING BEAN

It's alive! – Well, no not really, but it's a good trick!

YOU WILL NEED

A biggish box, with a lid
A Smallish Marble
Some foil, kitchen or Easter egg!
A Finger

WHAT TO DO

1. Wrap a strip of foil round your finger and firmly close one end round the tip of your finger.

2. Take the foil off your finger and pop in the marble, it should be able to fall to the bottom without getting stuck – you may need to borrow someone's bigger finger if this doesn't work!

3. Now fold in the other end - don't worry if it's a bit rough at this stage.

4. Place 'bean' in the box, put the lid on and shake vigorously!

5. You will hear the 'bean' bash against the inside of the box, this is smoothing the bean out, let the bean out when you are happy with its smoothness.

6. Voila! Or should that be Foila! Roll the bean round on your hand, or in the box and you'll see it 'jumping'.

ANY SCIENCE HERE?

Because the marble is heavier than its foil covering, once it is moving it has greater momentum, so that is one of the reasons it keeps moving after the foil covering has stopped, making it look like the bean has a life of its own.

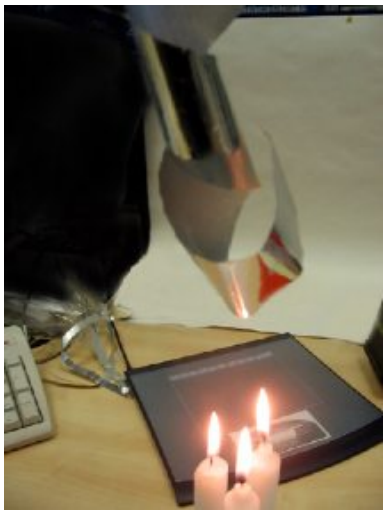
FOIL SPIRALS

Here's a good excuse to scoff as many chocolate eggs as you can: tell your family that you need the foil for an important experiment!

YOU WILL NEED

Foil from a chocolate egg (or if your eggs are wrapped in plastic, use kitchen foil)
Sticky tape, about 2.5 cm wide
A gentle heat source - a radiator or convector air heater (we used candles as a substitute, but don't use them unless you have no choice, and if you do please be very careful!)

WHAT TO DO



1. Carefully smooth a strip of the foil out with the back of your fingernail. Be patient! The strip should be the same width as the sticky tape, and as long as possible.

2. Cut a piece of sticky tape the same length as the foil and stick it onto the smoothed down foil.

3. Trim the foil/sticky tape strip off the rest of the foil.

4. Hold the strip by one end over the top the heat source.

After a few seconds the strip will start to bend, then curl up into tight spirals.

WHAT'S HAPPENING?

Most substances expand when they are heated, but different substances expand by different amounts. As the foil heats up it expands more than the plastic tape, but as it's stuck to the tape it can't expand uniformly. The outer side of the foil lengthens, while the inner side stays the same length as the tape. Because the two sides are no longer the same lengths the strip starts to curl.