**Lizard Variation and Evolution**

*This lesson plan is adapted from a brilliant activity developed by Tyler Rhodes. More information here:*[*http://blogs.scientificamerican.com/psi-vid/2012/02/29/an-evolution-animation-unlike-any-youve-seen-before/*](http://blogs.scientificamerican.com/psi-vid/2012/02/29/an-evolution-animation-unlike-any-youve-seen-before/)

**Learning Objectives:**

* Recognize that living things can change over many generations.
* Identify how animals and plants are adapted to suit their environment in different ways, and how the pressure to adapt may lead to evolution.
* Understand the importance of variation within a population of animals.

**Prep Required**

* Print out the **Top Trump Cards Worksheet** so there is one card for each pupil. Cut the cards out.

**Starter (15 minutes)**

*Aim: To show that even when we try to replicate things exactly, we create small variations.*

1. Draw a lizard on the board and colour it in.
2. Ask each child to draw a similar lizard on an A4 piece of paper.
3. Point out that they are all slightly different (sizes, colours, longer or shorter legs, etc.).
4. Explain how there is ***variation*** between all different animals. (The PowerPoint has images of different lizards in the natural world to reiterate your point).

**Variation**

Difference in the size, colour, presence etc of a trait/characteristic within a species/population.

**Class Activity (30 minutes)**

*Aim: To introduce the idea of adaptation, natural selection and change over time/evolution. To introduce the idea that it is advantageous to have variation in a population.*

1. Split the class in half and ask each half to decide which one of their lizards will survive the best in one of the below scenarios:
   1. The temperature within the habitat changes dramatically. The climate is now very warm. (Good lizards: small lizards that can hide under rocks, lizards with thin skin)
   2. There is a fire which burns down all the trees in the area turning the landscape black. (Good lizards: Dark coloured lizards that can be easily camouflaged)
   3. A predator comes into the area which can easily eat the lizards. (Good lizards: lizards that are camouflaged, that are small and agile, that can climb trees, small lizards that can hide)
   4. There is a flood which causes the ground to become marshy and boggy. Animals have to climb up into the trees to stay dry. (Good lizards: small lizards with claws that can climb into the trees, light lizards with wide feet)
2. Pin the two chosen lizards onto the board and ask each half of the class to try to copy the lizard they chose onto another A4 sheet of paper.
3. Repeat. Ask each half of the class to choose the lizard they think will survive best in the same scenario as before.
4. Repeat this steps 2 and 3 a third time. The scenarios stay the same throughout the activity.

Pin the lizards up on the board as shown:

Machine generated alternative text:
|0Second Round 
Lizard 
Second Rou 
Third Round 
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1. Animals change over generations. What differences can they see? Although the lizards have only changed a little bit over three generations, over many generations large amounts of change could be observed. Over millions of years, animals can change enough that they become a different animal altogether.
2. ***Adaptation*** - lizards that had characteristics that help them to survive and reproduce, survived/were the best. They are **adapted to their habitat**. Over time the characteristics of the lizards in the population changes, this is called ***natural selection***.

**Habitat**

The natural home or environment of an animal or plant

1. The two third-round-lizards should be different because the characteristics that were selected for in the first round would be slightly different.

**Natural selection**

The differential survival of different forms of the same organism due to environmental pressures

1. Using the last set of lizards drawn by the class, introduce a new scenario from above. Explain how the environment is dynamic and often changing, leading to changes in habitats. Ask the class which of their lizards they think will survive in the new environment? Which side of the class has the most surviving lizards? The side of the class that has the most surviving lizards and should have the most variation amongst their lizards as they will have more lizards that best fit the new scenario.
2. Discuss how **variation is important** within a population as otherwise a change in the environment could lead to the total ***extinction*** (define extinction).

**Extinction**

When there are no-longer any living members of a species

1. If the task does not produce the correct result, ensure to explain what should happen.

**Plenary (10 minutes)**

*Aim: to reiterate how natural selection occurs in a population and to highlight the importance of variation in order to deal with a changing environment.*

**Misconception!**

It’s very important that the pupils know that religion and evolution can co-exist. Evolution is scientific fact and religion is a matter of faith. Evolution makes no statements about religion and should be taught as scientific fact, not as an alternative to religion.

1. Give each pupil a **[Top Trump Card]** and they should all stand up.
2. Roll the dice and those children with a number lower than the dice for the chosen characteristic sit down. Discuss what will happen to the population in the new environment especially what the animals will look like after successive generations and natural selection.
3. Roll the dice again and repeat the process until only a few children are remaining. This highlights how the environment changes (when the dice is rolled) and those that have characteristics suited to the environment survive and those that don’t die. Reiterate therefore how important it is to have variation within a type of animal. Also make sure that the children realise this is happening over a long time scale – thousands of years.