



Tips on Asking Good Scientific Questions

by Julie Wiskow

Questions are an essential part of science. A good scientific question builds on what children already know and when answered, leads to other good questions. For a scientific question to be meaningful; however, it needs to be testable either by **experimenting**, **measuring** or **observing**.

Purposeful science enquiry happens when children are motivated to answer a question that matters to them. It involves them in collecting and analysing data, developing explanations and solving problems about the world around them.

So how do you help children to develop of a good scientific question?

- Ask your pupils to think of a topic that interests them and challenge them to come up with a list of questions.
- Guide them in the elimination of questions that cannot be answered either by direct observation or by gathering evidence.
- Help them to break broader questions such as “What makes a seed grow?” down into smaller questions that can be investigated one at time.
- Demonstrate how to word questions in a way that allows them to be answered by an experiment. Here are some are some good ways to begin scientific questions: -
 - How does . . . effect . . . ?
 - What is the effect of . . . ?
 - What is the relationship between . . .
- A testable question asks how one change (independent variable) influences something else (dependent variable). Check that your question can do this.

Children can answer their scientific questions in several ways

- **Observation Over Time**
 - What happens when you add a stack of sugar cubes to coloured water?
 - How does the weight of food change as it dries?
 - How do our shadows change over the course of a day?
- **Pattern Seeking**
 - Is there a relationship between the size of the leaves on the tree and the amount of daylight underneath?
 - Is there a relationship between the height of a person and how fast they can run?
- **Comparative and Fair Testing**
 - Which suntan cream protects you best from the Sun?
 - How does the size of the balloon affect the distance the buggy travels?
 - Does the temperature of water affect how quickly it freezes?

Some Science Project Ideas

Biology

- Does seed size affect plant height?
- Does fruit size affect the number of seeds in the fruit?
- Do different colours of light affect the direction of plant growth?
- Do sounds (music, noise, etc.) affect plant growth?
- Does freezing affect seed germination?
- Do different types of artificial light affect plant growth?
- What is the effect of increased or decreased oxygen on plant growth?
- Does the direction seeds are planted affect plant growth?
- Which stays fresher longer: organic or non-organic fruit?
- How does temperature affect the growth of mould?

Chemistry

- Does the type of liquid affect how fast an ice cube melts?
- Which can support more weight: paper or plastic grocery bags?
- What brand of paper towel is most absorbent?
- Does the colour of a shirt affect the amount of heat it absorbs?
- How does the type of liquid affect how much a penny will corrode in 5 minutes?
- How does changing the amount of baking soda or vinegar affect the height of an explosion?
- Do expensive nappies absorb more urine?
- What material filters oily water the best?

Physics

- Through what material does sound travel the best?
- What material is the best to keep heat in?
- Will more air inside a basketball make it bounce higher?
- Does the thickness of the wire affect the power of the circuit?
- How does the temperature of a tennis ball affect the height of its bounce?
- Do different brands of batteries last longer than others?
- Does the length of the wire affect the power of the circuit?
- Does changing the wingtip direction affect an airplane's flight?
- Does changing the height of a ramp affect how far a car will travel?
- Does changing the size of a paper airplane affect how far it flies?