Module 3: Planning

Thinking about challenge (based on an idea generated by the National Strategies: Science)

A

B

C

D

Conceptual

challenge

Procedural

challenge

A practical activity may present a variety of challenges to pupils. In this task, we consider just two challenges – conceptual and procedural.

**Examples**

1. Setting up a microscope and slide to study and draw cheek cells is, for most pupils, more challenging procedurally than conceptually, so would go into A.
2. Getting a ripple tank to produce waves that clearly demonstrate refraction can be tricky to set up and also more challenging to understand, so would go into B.
3. Attaching a force meter to a trainer and measuring the force needed to drag it across different surfaces is straightforward both procedurally and conceptually, so would be in C.
4. The electrolysis of brine is straightforward procedurally but trickier to explain the ideas as to why what happens has happened, so would go into D

**Activity**

* A brief description of ten practical science activities is provided. Think about the levels of procedural and conceptual challenge presented by each practical activity and write the activity number in the corresponding zone in the chart above.
* Think about how you could adjust the levels of challenge by presenting the activity differently for examples of activities you placed in zones B and C

***Practical science activities***

|  |
| --- |
| 2. Observe and draw the principal features of a cheek cell and explain their functions. |
| 3. Investigate the correlation between height and lung volume in humans. |
| 8. Test a variegated leaf for starch to show that chlorophyll is needed for photosynthesis. |
| 18. Compare the effectiveness of different indigestion remedies. |
| 19. Devise a method for comparing two endothermic reactions. |
| 22. Make observations of changing day length and link these to a model of the solar system. |
| 25. Investigate the effect of different factors on the motion of a toy car rolling down a slope. |
| 30. Compare the current flow in different parts of a parallel circuit and use a model to explain findings. |
| 37. Use an oscilloscope to demonstrate the effect of changing pitch and volume of sound. |
| 44. Measure recovery rates after exercise using the pulse rate in a radial artery. |

You may also wish to think about activities you have recently used and identify which zones they occupy.

**Questions**

1. Should students spend time on anything in Zone C?
2. Is it generally true that GCSE required practicals tend to be located in Zone B?
3. Why might there be good arguments for getting students doing practicals from Zones A and D?