

Assessment for learning in STEM teaching

Questioning (4 transcripts)

Transcript 1

Science Class with 13/14 year olds

Teacher: A painter has difficulty trying to get the lid off a paint pot. Is it better for him to use a longer, shorter, wider or stronger screwdriver to prise the lid off? Hands up for longer? Shorter? Wider? Stronger? So most of you have gone for stronger or longer. Chris – why stronger?

Chris: Then he can push more and not worry about it breaking.

James: If it's stronger it will make the force bigger.

Teacher: And the longer group?

Penny: Longer makes the force bigger.

Transcript 2

Science Class with 16/17 year olds

Teacher: Is it always true that enzymes breakdown things? Chat and make some notes. Three minutes.

Teacher: Okay. Gail's group. One idea please.

Gail: We thought it would depend on the type of enzyme. Lipase breaks down fats but it wouldn't work on other things like starch. Teacher writes specificity on the board.

Teacher: Lee's group?

Jack: We got that one and also the other conditions would need to be right. Teacher writes conditions on the board.

Teacher: Can you say a bit more about the conditions?

Jack: The temperature. pH.

Teacher: Janine – did your group get anything else?

Janine: We wrote denatured.

Teacher: Explain that one for me.

Janine: If the temperature gets too high, the protein structure of the enzyme unravels and then it won't work.

Anna: Lock and key. Enzyme loses its shape and so won't unlock it.

Teacher: All that you have said so far is right but I think you are only thinking about enzymes in the gut. Starch-amylase etcetera. Any of you thought about enzymes elsewhere? In the cell? In the mitochondria?

Transcript 3

Science Class with 5/6 year olds

Teacher is about to shine a torch at an object, casting a shadow onto a screen, and then move the object closer to the screen and further from the torch.

Teacher: So we are going to ask Mr Clever, whether the shadow gets bigger or smaller, the closer you get to the screen? What do you think? Put a tick on the purple sheet if you think it gets bigger. If you think it gets smaller, put your tick on the yellow sheet.

Children line up besides the purple or yellow sheet on the board and draw their ticks.

Teacher: So 11 people think it gets bigger and 9 of you think it gets smaller. Let's have a go now and see what we can find out.

Transcript 4

Science Class with 11/12 year olds

Teacher: So let's see what you found out from making your circuits. What happened when you increased the number of bulbs in the series circuit? Jason?

Jason: With two lights it got dimmer and then with three they didn't light.

Teacher: Anyone get three to light? No. So three bulbs looks like too big a resistance for the circuit.

Teacher: So what about when you arranged the bulbs in parallel? Did the bulbs get dimmer this time?

Lola: A bit but not as much as.

Hannah: One of the bulbs got dimmer but the other one didn't.

Teacher: Mmmm sometimes that happens because the bulbs vary a bit. How did the bulbs compare when you had two in series compared to two in parallel?

Hannah: It was dimmer.

Teacher: Which was dimmer – the series or the parallel?

Hannah: Both bulbs got dimmer in the series one but only one did with the parallel.