

## Assessment for Learning in STEM teaching

### WAGOLL – What A Good (HPQ) One Looks Like

<p>1.</p>	<p>Which of these is a mixture - air, carbon dioxide, oxygen, seawater?</p> <p>It is not easy to guess both correct answers; a teacher can tell at a glance if most of the class have understood the difference between mixtures, solutions, compounds and elements. The teacher can decide which students should do what next, depending on the mixture (!) of answers.</p>
<p>2.</p>	<p>Which of these explains how we see an object in a mirror?</p> <p>A. Light travels from the eye to the object and into the mirror.</p> <p>B. Light bounces off an object into the eye.</p> <p>C. Light bounces off the object into the mirror and back into the eye.</p> <p>Using the question as a hinge-point question would provide a quick way for the teacher to ascertain students' understanding of how light is reflected in order for us to see objects in mirrors. The teacher will be aware that there are alternative conceptions around this area of science and for the students who provide incorrect answers the teacher may be able to interpret why this has happened. The teacher can then use this information to assist their instructional decision making.</p>
<p>4.</p>	<p>Which of the following is <b>true</b> about the Moon?</p> <p>A. It reflects light.</p> <p>B. It orbits the earth.</p> <p>C. It can't be seen during the day because there is too much light.</p> <p>D. It has no gravity.</p> <p>It would not be easy to guess both of the correct answers (A and B); and using the question as a hinge-point question would provide a quick way for the teacher to ascertain students' knowledge of the Moon. The teacher will be aware that there are alternative conceptions around this area of science and for the students who provide incorrect answers the teacher</p>

may be able to interpret why this has happened. The teacher can then use this information to assist in her or his instructional decision making.

6.



Which of the following statements is true?

- A. AB is longer than CD.
- B. AB is shorter than CD.
- C. AB and CD are the same length.

Using the question as a hinge-point question would provide a quick way for a primary school teacher to check students' understanding of the concept of length.

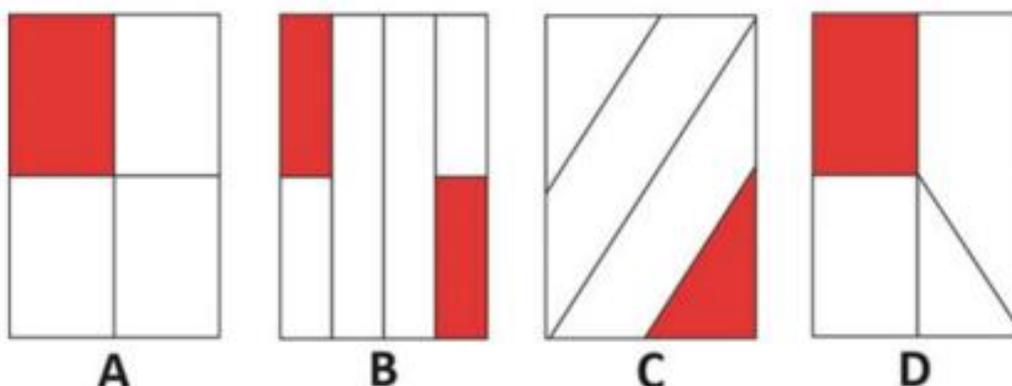
7.

Which of these are characteristics of an enzyme?

- A. They are proteins.
- B. They dissolve food.
- C. They can often be reused in the reaction process.
- D. They are produced in animals but not in plants.

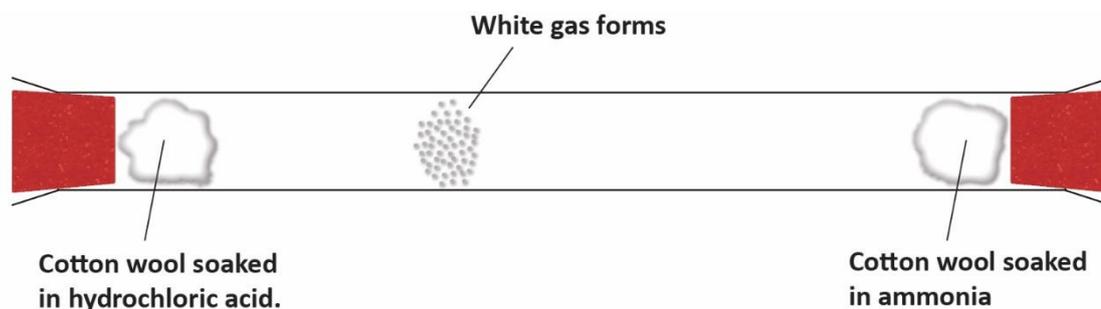
It would not be easy to guess both of the two correct responses (A and C), and different combinations of answers would point to students having different kinds of misconceptions about enzymes, their characteristics and how they function. It would be thus be possible to pre-plan differentiated follow up work which students could do depending on their responses to the question.

11. In which of the following diagrams is one-fourth of the total area shaded?



Using this question as a hinge-point question would provide a quick way for the teacher to ascertain the depth of students' understanding of fractions. It would not be easy to guess the three correct responses (A, B and D), and different combinations of answers would point to students having different kinds of misconceptions about fractions, for example that if one out of four regions in a diagram is shaded, the four regions have to have the same area for the shaded area to represent one fourth. It would thus be possible to pre-plan differentiated follow up work which students could do depending on their responses to the question.

14. Hydrochloric acid and ammonia were placed either end of a long glass tube and a band of white gas was formed as shown:



Which of the following inferences can be made from these observations?

- A. A reaction has taken place
- B. Diffusion has taken place
- C. A new product has formed
- D. Gas particles travel at the same speed at room temperature

We think that this is a particularly effective hinge-point question, because, students who select the full correct answer (A, B, C) would be very unlikely to have guessed this combination of responses, and because those who do provide the correct combination of

answers are likely to have understood quite a lot about both the rate of gas diffusion, chemical reactions, and the resulting formation of new products. It would be thus be possible to pre-plan differentiated follow up work which students could do depending on their responses to the question.