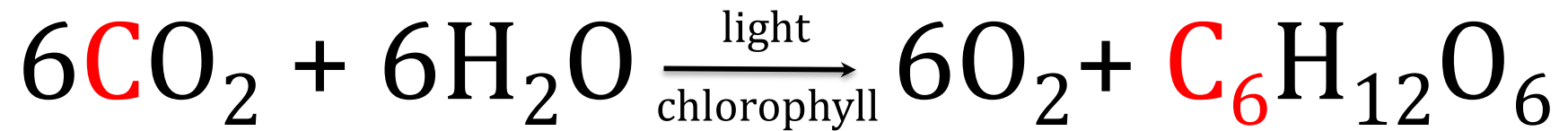


Topic	Photosynthesis equation	Level	GCSE (or any course for students aged 11-16)
Outcomes	<ul style="list-style-type: none"> To consider how the symbol equation for photosynthesis relates to the substances and processes involved (e.g. H_2O relates to water in the soil that enters the plant via root hair cells through osmosis) To annotate 		
Information for teachers	<p>Students can often write the equation for a process such as photosynthesis but have little understanding of what the symbols mean. For example, that H_2O refers to water from the soil and not the air.</p> <p>This activity could be used to activate prior knowledge before teaching or as a revision activity at the end of a topic. Students could work on this in pairs or alone.</p> <p>You could adapt this activity by using a word equation. You might want to model one annotation so students are clear on what they need to do. The word annotation might need explaining too.</p>		
Pedagogy focus	<p>This activity uses a goal-free type problem to explore what students know. Slide 3 could be used after the activity to help students connect together the different levels of scientific knowledge e.g. macroscopic to microscopic.</p>		

Annotate this equation to
show everything you
know about it

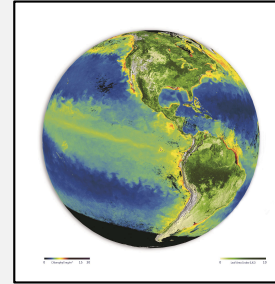
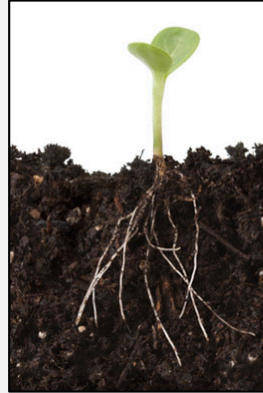
Some ideas to include:

- names
- displayed formula
- where the substances come from and go to
- how the substances enter the plant
- uses of the products



Layers of meaning to understand photosynthesis

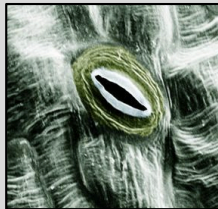
Macroscopic and
tangible



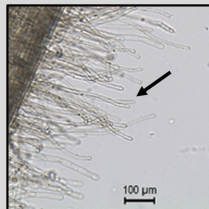
Microscopic
cellular



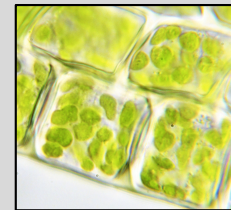
carbon dioxide enters
and exits a leaf
through **stomata**



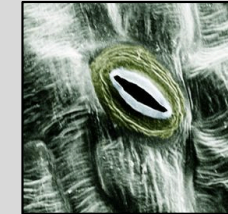
water enters the
plant through
root hair cells



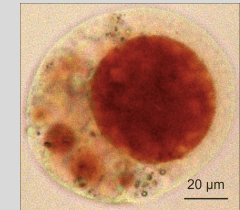
chlorophyll in
chloroplasts
absorbs energy



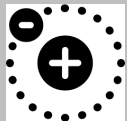
oxygen enters and
exits a leaf through
stomata



glucose may
accumulate in
the **vacuole**



Molecular
and invisible



carbon dioxide
molecules in the
air and leaf

water
molecules in the
soil and plant

photons of
light striking
chlorophyll
molecules

oxygen
molecules in the
air, soil and plant

glucose
molecules inside
the plant

Symbolic

