Introduction to subduction metamorphism

This exercise is designed to be motivating but it also allows for the instructor to evaluate learning outcomes from the module. The motivational aspect comes from having students come up with questions about subduction and subduction zone metamorphism themselves. It is an "inquiry-based" approach. To evaluate learning outcomes from the module, the instructor and the student can compare their drawing at the beginning of the module to a drawing made at the end of the module.

Draw a cross-section of a subduction zone

As an introductory exercise ask students to draw a cross-section of a subduction zone. You can give them minimal guidance initially and then ask for more detail, you can give them detailed instructions at the start or you can ask them questions as they draw to get them to think as they sketch. This exercise can also be done by putting the students in pairs.

In their sketch ask them to think about and include the following pieces of information:

1) What are the different rock types that enter a subduction zone?
2) Draw in isotherms (lines of constant temperature). You might suggest three lines at 250º, 500º, and 1000ºC. Start by drawing in horizontal isotherms away from subduction zone then ask them to think about what happens within subduction zone.
3) What angle does the subducting plate make with the overlying plate?
4) Beneath the arc volcano what is the depth of the subducting slab?
5) What is the contact between the overlying plate and the subducting slab like?
6) Draw in different rock types that occur in the various parts of the subduction zone.
7) What are minerals that develop in basaltic rocks within a subduction zone?
8) How do we know all these things?
9) What questions do students have about subduction zones that arise from this exercise?