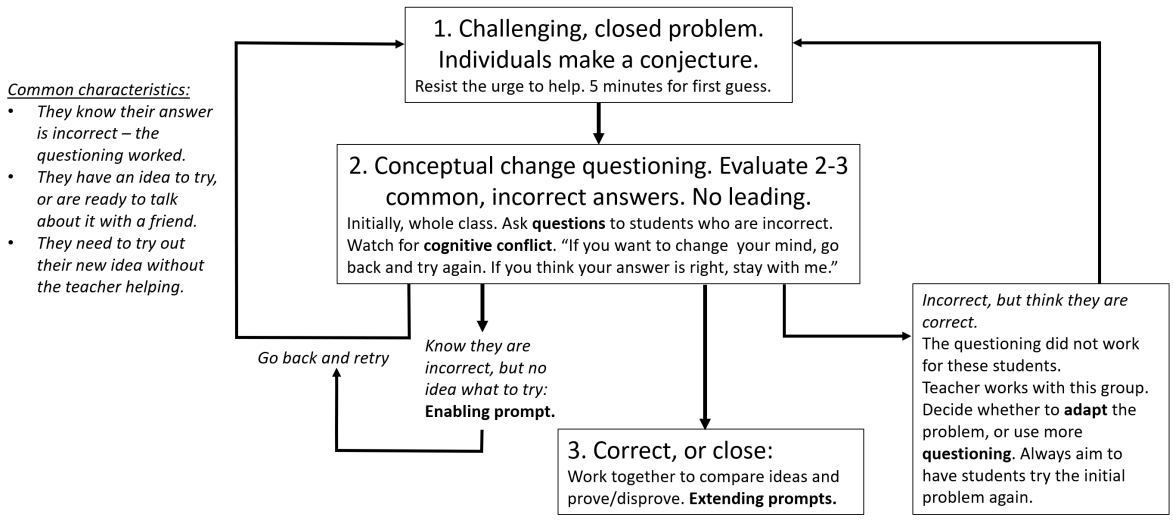
# Basic lesson structure for all challenging task lessons:

Experimental problem lesson phases




1. **3-5 minutes:** Introduce the problem and discuss ideas as a class. Provide physical manipulatives if appropriate. Unless absolutely necessary, start all students on the first problem rather than adapting it.
2. **3-5 minutes:** Students have their first try. Your job is to observe answers and look for common misconceptions.
3. **10-15 minutes:** Come back together as a whole class. Use the questioning provided to evaluate common incorrect answers, focusing on the students who had that answer. Aim to put those students into cognitive conflict – where they feel uncomfortable with their idea – rather than leading them to the correct answer.
4. **15 minutes:** Separate students to provide differentiation.
    a. If they want to change their minds, then they should go back and have try 2, working together as appropriate. If they think they are right, they stay with you.
    b. Further separate the students who think they are right into two groups: those who are right or close, and those who need help. Have the students who are right/close work as a group to show their working ("prove it"), then work on the manipulation/backward questions as an extension. For further extension, see the "additional suggestions" every fifth week.
    c. Work with the students who need help, providing extra questioning, adapting the numbers to be easier to work with, providing enabling prompts or additional explanations as you think are necessary.
5. **15 minutes:** Check how the students having try 2 are going. If they solve the problem, provide the extension to them and have them prove it. If they need more questioning, group them together and provide it.
6. **Next lesson *prior* to beginning next task:**
    a. Begin with an editing time for students to change anything that they want to. This can be done individually, or in pairs.
    b. Choose a student who has used a good strategy to explain how they successfully solved the problem. Note: if there are not strategies that you want students to use, then skip this step.
    c. Using their explanation as a stimulus, reexplain and explicitly teach the strategy. Show the steps on the board.
    d. If there is a second strategy that you want to teach, go ahead. Show both strategies side by side, using the same numbers to decrease cognitive load.
    e. Have students pair up and compare/analyse both strategies – what is the same about both? What are the essential mathematical steps?
    f. Have students copy the example, then practise the steps with a similar question.