GRAPHIC DESIGN H.O.T. LESSON (*this is from MS (yellow) → VR (green) → MS (pink))*
To follow students' individual work on prompt and reflection

Language goals:

1) have students generate alternate phrases for "fixed fee" or alternate ways to explain "charges a fixed fee of $50 plus $25 for each hour".
2) Continue to build idea of what makes a good explanation; use a language frame: Lee is ___correct/incorrect____ because _____

Higher order thinking:

1) students will develop 2 different explanations to justify their results for the graphic design charges prompt
    a. Key mathematics: students need to think *globally* about all possibilities, and not just use 2 points to make a claim.
    b. Students should be able to make sense of idea that, even though the competitor starts lower, b/c his per hour rate is higher, the competitor is eventually more expensive.
2) students will evaluate other students' explanations and reflect on/critique their own
3) Students must understand that, mathematically, something is not true even if there's just one time when it is not true. "Mostly true" in math means false.*

* *I actually think that this is both a content and language objective.*

Initiation: Recall on Friday that we looked at tables of data or information and we wrote an equation to represent the data (CD sales: S=10c). We also drew a graph to model the data. Today, we will extend these skills to another problem about graphic design.

Remind how groups work; explain *group questions*; remind of norms/community agreements.

Pre-group students heterogeneously. VR will do this based on previous student interactions.

Explain and assign group roles…allow students to volunteer for a role first. If not, randomly assign. Megan, do you have explanations for the roles that I could type up and make copies of for tomorrow? Any suggestions about other roles?

Team leader
Reader
Recorder
Spokesperson?

(I really like the idea of a reader best. Their role can be both to read the problem, but also to make sure that the group understands the problem, and even when the group is working, they should check to be sure the group is keeping in mind all the information in the problem.) (I think you might want to do volunteers for spokesperson first time around.)
Handout task sheet. Read through it as a class. Then, have team reader re-read to group.

Let groups work

Task 1: they need to rewrite the problem in different words for another class.

All students should write it down, but the recorder is responsible for the one copy to be submitted for the group.

2 groups share with class based on our observation.

VR records the terms or phrases they used instead of "fixed fee" on the board.

Should we discuss the words "rates" or "competitor"? Sure – whatever you think needs to be talked about

VR asks others to share not whole problem, (unless unique way), but just how they rewrote that first sentence.

Task 2: solve the problem. Your group must come up with at least 2 different ways to explain your result. Your results should begin this way:

We think Lee's competitor is ____(correct, incorrect)___ because _____

When your group is ready to share one way to explain your result, the Team Leader should raise his/her hand for a teacher to come over. The teacher will ask anyone in the group to begin to explain your solution. I like this –this serves as an important check-in spot. Promotes the idea that ALL are responsible for understanding. This is an important piece they'll need to learn about groupwork (and have reinforced)..

If students aren't seeing globally, we may want to remind them what the problem tells us and what it doesn't tell us. We know how much Lee and the competitor charge, but we don't know how many hours it will take them.

Great. Another approach coming to mind is to see what the students have done. Say they did it for 2 hrs and for 14 hrs. We could say "So, you've shown me that this is true (or the competitor is correct) for a job that will take 2 hrs and a job that will take 14 hrs. Is there a way you can convince me it's true ALWAYS? For ALL different sized jobs? How could you show me that? (I'm the judge and that's not convincing enough for me?)

If students have trouble starting the problem, we may suggest that they think about how to represent the information in an easier way since we practiced with tables and graphs on Friday.

Love it.

Another approach – invoke the scenario. Ask them – so suppose you have a graphic design job? You need someone to design a t-shirt for you for your sports team, or for a local fundraiser you're involved in. How would you decide who to go to?

Explanations should be written on easel paper to post on the back wall.

Posters with explanations will then be posted in the back.

Before 1st group explains, reinforce norm of *listening*.

Who will share their results and justifications? Can we make this a role such as "Spokesperson"? This person should begin the discussion, but other group members can add

their input. With my q, I actually meant whether all groups would share, or if just some would be asked to, and if so, how you might decide.

Task 3: Critiquing other students' work on the same prompt. *These are selected from student work samples used for scorer samples or from VRs' students' work. I attached the full PDF file that has 2 samples of students work for each score. (Note that for them, students don't have to explain as long as they explicitly show work (and you can see their argument).) (see p. 47 for Graphic Design prompt)*
We didn't get any farther with this. What does it look like? How many samples of student work? Will students be asked to identify strengths and weaknesses in the explanation? To determine a score for the work based on a CAPT-like prompt? We did talk about them then revisiting their own work and deciding whether they were happy with the explanation, or whether there was a place they would want to improve it?

We can give groups 2 prompts (i.e. 3 and a 1) to analyze so that they have some kind of comparison to draw conclusions about strong and weak explanations. I can make copies for each student. Groups can discuss which is "stronger" based on evidence—does the student (1) answer the question and (2) convince you? Write down specific things from their work that convince you. Is there anything confusing? All students should write, not just the recorder. This will be collected.

Should we plan to discuss these prompts as a class or just finish with the exit slip below? If we give every group the same 2 prompts, then it will be easier to discuss what was convincing or confusing.

Closure: Exit Slip—*Students will review their peer's explanations and identify one product they believe is a good explanation and explain why.*
Collect in: _____
Note: there probably will be some spillover into the next class period, so this may need to be created to fit the moment.
Materials:
CAPT-like prompts (MS)
Reflection on the problem, with prompt on back (MS)
Graph paper (MS)
Easel paper (VR has graph easel paper, but not regular easel lined paper….MS, do you think you can bring some of this paper)
Markers (VR & MS)
Calculators (VR)
Rulers (VR)
(masking tape for hanging posters….MS, I have scotch tape, but I don't think I have masking tape.
Check – we have sticky easel paper

Other ideas that were floating around:

1) using the idea of a judge and a jury. Someone may be innocent (or guilty), but there has to be convincing evidence given. Students could be prompted to think not about the right answer, but rather, was convincing evidence given for the case.
2) idea of helping students by asking them to compute the costs for different sized tasks (one student might have a 4ht task, another a 2 hr task…) This would help students see the inadequacy of testing just two points.
3) I'm not sure where the true or false discussion comes in. Perhaps we just listen for it, and take it up when it comes up in some context. Alternately, bring it up during the last part of the class.

Questions I found myself asking:
How will we ensure individual *and* group accountability? Checkpoints during the task? Written products?

Other needs:

- develop the task sheet (VR)
- develop the paraphrasing paper and prompt critiquing paper-½ page each (VR)
- work out the specifics of the 3rd component with them evaluating/critiquing different explanations.