

Candy Party: Higher Order Thinking Strand 25-like CMT

Grade Level: 3

Date: 11/2/09

This lesson is meant to be taught using the prompt attached to the lesson.

Learning Objectives: *students will be able to...*

- use knowledge of 2's, 5's, and 10's multiplication facts in solving a more complex problem
- develop strategies for solving a multi-step problem with constraints

Language Objectives: *students will be able to...*

- define the terms, "at least" and "at most"
- discuss with a partner and explain why their solution is a valid answer to the problem
- explain what "constraints" mean in the context of the problem

Materials:

- Prompt
- Pencils, paper
- Large display of the constraints on a whiteboard, chalkboard, or chart paper
- Large display of the chart to write in some student answers
- Students' definition of "at least" and "at most" displayed while students are work on prompt

Procedures:

Initiation:

1. Explain to students that they will be doing an open-ended math question with some help and that they will learn how to solve a multi-step problem on their own and learn some new vocabulary words – constraints, at least, at most. (go over expectations for sitting on the carpet)
2. Gather students in front of large chart paper displaying the problem (without the chart).
 - a. Read through problem once with students and ask any words they do not know or any things that are confusing.
 - i. Discuss "constraints", "at least", and "at most" – define all three words on the chart paper with the problem.
 - ii. Discuss as a group the constraints one by one and what they mean providing concrete examples of at least, and at most. *Ex: please take at least one marker, please take at most three markers.*
 - b. Ask students to state in their own words what the problem is asking them to do. If students cannot explain what the problem is asking discuss further what the constraints mean and talk about the context of the problem until the students demonstrate an understanding of their task.
 - c. Show students the chart and ask if anyone has an idea of how they could use the chart to help them solve the problem and organize their work.
 - i. Discuss how to fill in the chart and what the columns and rows mean.
3. Send students back to their seats with copies of the prompt and let them know they may work with someone sitting next to them or they may work alone – whichever way helps them think better.
 - a. Go over briefly how to work with a partner and how working with a partner does not mean copying because everyone will have to explain their answer when they are done working to complete the checkpoint.
 - b. Let students know that if they solve this problem quickly there is a challenge problem waiting for them, but not to hurry because they need to do their best work on this problem first before tackling something more difficult.

Activity:

1. Students work at their desks on the prompt talking with each other if they get stuck or raise their hands and ask a teacher.

2. When students are finished ask them to explain how they solved the problem and give them a sticker for the checkpoint.
 - a. If students finish early give them a copy of the challenge problem briefly explaining the directions.

Closure:

1. Gather students around the chart-paper with the chart from the prompt on it and ask if anyone wants to share and explain his or her answer.
 - a. Upon analyzing the student volunteer's answer, review the constraints and the definitions as a whole group to make sure the student followed each constraint; *physically check off the constraints once they are satisfied.*
 - b. Ask students if anyone has a different answer and then while student B is writing his or her answer ask the group why there could be more than one answer to the problem.
 - i. Have student B explain how he or she arrived at his or her answer and check the answer with the constraints.
 - c. *Go over as many different solutions as time allows making sure students have an understanding of the definitions and how to check against the constraints.*
 - d. Depending on how many students made it to the challenge problem, discuss their answers if time allows.
 - e. To close the lesson, ask students what they learned from this problem. Do they have any questions or are still confused about something?

Assessments: *Informal*

- Student questions and answers
- Student explanations on how they solved the problem
- How many were able to begin the challenge problem
- Students explanations of "at least" and "at most"
- Teacher questioning to random pairs of students during the activity to check for understanding

Assessments: *Formal*

- Student answers shared during the discussion
- The answers to the prompt and the challenge question collected at the end of the Math period