Sanger Unified School District
Central Valley Math Project
6th Grade Lesson Study 2010-11
Fall 2010

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Facilitator:

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Lesson Study Goal: Students will become better problem solvers in real life situations through the use of critical thinking skills and be able to collaborate effectively with others.

Unit Goal:

Lesson Goal: Students will solve subtraction problems with positive and negative integers using a T-chart.

6th Grade California Mathematics Standard(s): NS 2.3 Solve addition, subtraction, multiplication, and division problems, including those arising in concrete situations that use positive and negative integers and combinations of these operations.

Manipulative, materials required: Integer chips, T-chart mats, overhead, post test, problems

Rationale for lesson: To give students a higher level of understanding of integers.

Time	Steps, Learning Activities, Teacher's questions	Expected Student Responses	Points of Evaluation
3 mins	**Objective:** Students will solve subtraction problems with positive and negative integers using a T-chart.		
4 mins	**Importance:** **Why is this important to learn how to subtract integers?** We come across subtracting positive and negative integers in everyday life such as calculating golf scores, statistics from sports, weather, and balancing a checkbook.	Some students will come up answers like: batting average, bank accounts, elevation.	

Time	Steps, Learning Activities, Teacher's questions	Expected Student Responses	Points of Evaluation
5 min	**Prior Knowledge/Review (WB):** *Integers:* Any whole number positive or negative. Example: (positive) +5 or (negative) -5 Non-Example: 1.2 (decimals) or ½ (fractions) Teacher: <mark>On your whiteboard, show me an example of an integer.</mark> <mark>Show me an example of a number that is not an integer.</mark>	Students will be able to give a correct example. Students will be able to give a correct example.	Whiteboard
25 min	**Concept Development:** (On the overhead) Remember when we used integer chips for adding? We are now going to use them for subtracting integers. ***Remind students that the yellow side represents a positive and the red side represents a negative. Pass out the chips and T-charts. Students		

	Using the chips and T-chart, solve this problem: (-8) + (-2) + 4 Answer: -6 Show the solution to the addition problem on the overhead. Now, using your integer chips and T-chart, show me the solution to this <u>subtraction</u> problem: 3 – 8 Pick 2-3 pairs of students to come to the overhead and model what they did to find the solution. Skill Development: Now, show me the solution to this problem: -5 – 8	Students will be able to solve the problem. Some of the students will come up with an answer of +11 because they will ignore the subtraction sign. Some students will know the answer is -5 but not know how to represent it with the chips. Some students will discover that by flipping the chips over they can come up with the correct answer. Some students will come up with an answer of 3. Others will come up with an answer of -13 but some students will not understand how they got it.	

	Let's take a look at this problem: Some of you put 13 negative chips. This is the correct answer but how did you get it? When we look at this equation we have a negative 5 and we are subtracting positive 8. So we have 5 red chips and 8 yellow chips. But because we have a subtraction sign, what do we do? So the rule to subtracting integers is we never subtract, instead we add the opposite. So if we have -5 – 8, we change the subtraction sign to addition and make the positive 8 to the opposite, which is negative 8. Then we solve the equation.		
3 min	Now solve this problem: -4 – (-2) Give students some time to solve. Review how to find the answer.		
5 min	Ok what is our numbers are too big to use the integer chips. Like in this problem: **What's the difference between 335 and -76?** First, we need to write an expression. 335 – (-76) Next, we have to add the opposite. 335 + +76		

	Teacher models T-chart.		
5 min	Now, use the T-chart to solve this problem. **A group of hikers climbed from Salt Flats (elevation–55 feet) to Talon Bluff (elevation 620 feet). What is the difference in elevation between Talon Bluff and Salt Flats?** Ask 2 students to show how they solved the problem.		
10 min	Give students a 5 problem assessment.		

5 problem Assessment

1) **16 – (-8)**

2) **-35 – (-12)**

3) **A football team starts their drive at the 20 yard line. On the first play they gained 6 yards and on the second play they lost 9 yards. What yard line are they on?**

4) **-5 – (-5)**

5) **One morning, the temperature was 5° below zero. By noon, the temperature rose 20° Fahrenheit (F) and then dropped 8°F by evening. What was the evening temperature?**