Week 22	30 7.3 A BP III 4.1	31 7.3 A BP III 4.2	February 1 7.3 A BP III 4.3	2 7.3 A BP III 5.1	3 Weekly Wrap up

Bits and Pieces III

Investigation 4, Problem 4.1 (2 days)

Determining Tax

Mathematical Goals	State Standards
• Understand that a percent is a decimal fraction with a denominator of 100 • Represent $1.00 as 100 pennies, and relate this to partitioning a number line into 100 parts • Represent percents as decimals and use decimal computation to compute percents **Vocabulary** **Materials:** Transparencies 4.1A and 4.1B , Labsheet 4.1	

1.	**LAUNCH** (10 minutes)		Teacher Notes
	Students may want to use percent bars to work on this problem. Copies of Labsheet 4.1 should be available. Use the introduction to the problem with your class. This allows you to review percent bars and to make sure students understand the task. Ask them about the sales tax in your state and how it compares to the 6% sales tax. **Have students work in pairs.**		

2.	**EXPLORE** (20 minutes)		Teacher Notes
	As pairs work on the problem, encourage them to look for more than one		

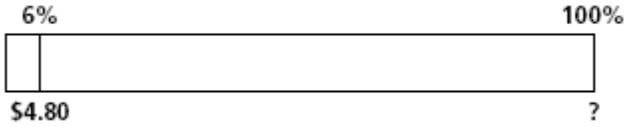
	way to solve the problem. Be sure they can explain their methods and why their ideas make sense. Ask questions about how Questions B and C of the problem are alike and different. • How do these differences affect the answers? If students are struggling, use a percent bar to help them think about the problem.		

3.	**SUMMARIZE** (15 minutes)		**Teacher Notes**
	Have different pairs share their results and explain how they solved Question A. Then look across parts B(1) and C(1), B(2) and C(2), B(3) and C(3), and describe what happens when the percent differs but the quantity stays the same. Look at how these patterns help one to think about finding the percent of any number. In each situation ask questions such as, • *If you pay 6% sales tax, what percent of the price do you pay?* This question is meant to nudge them toward understanding that price + 6% of price = 100% plus 6% of price, which is 106% of the price, or 1.06 X price. It is fine if students continue to compute the tax and add it on, but the efficiency and understanding that come with realizing that you can do this in one step is worth working on over time. Question D asks students to work backwards to find the price of the item when you know the percent of tax and the amount of the tax. As students		

explain their strategies, help them see that you can restate the question as

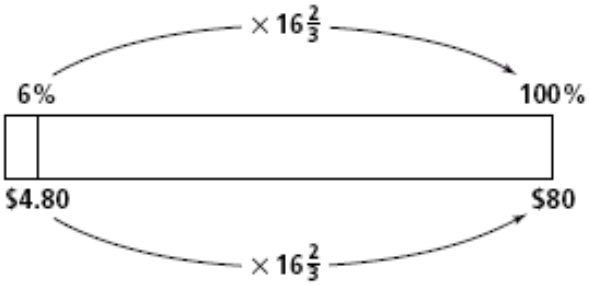
"If 6% is $4.80, what is 100%"? Visually on a percent bar the situation

looks like this:



Students may focus on the part 6% is of 100% (or how many 6's in 100) and divide $\frac{100}{6}$ to get 16 $\frac{2}{3}$.

- *Now we know that we have to multiply 6% by* $16\frac{2}{3}$ *to get 100%.*
- *What does that tell us about how to find the amount that goes on the percent bar under 100%?*



4.	ASSIGNMENT GUIDE		Teacher Notes
	PISD On Level ACE4 day one (1-3) ACE 4 day two(13, 14, 33)		

Bits and Pieces III
Investigation 4, Problem 4.2
Computing Tips

Mathematical Goals	**State Standards**
• Represent percents as decimals and use decimal computation to compute percents. • Explore the relationship between 1% and 10% and use these to compute 5%, 15%, and 20% tips. • Work backwards to find the amount of the bill if you know the tip and the percent of tip for the bill **Materials:** Calculators, Labsheet 4.2A (Menu), Labsheet 4.2B (Order Blank)	6.11A, 6.11D, 6.3C 7.3 **Local Standards** 6th Exam Obj:# 23 6th H Exam Obj. #11

1. LAUNCH (10 minutes)	**Teacher Notes**
Talk with your students about going out to restaurants and that it is customary in this country to leave a tip for service and that 15% to 20% of the bill is usually what is left. You might want to check to see if they understand the context by asking them the following: • *If your food bill is $10 and you want to leave a 15% tip, how much is the tip?* • *How does finding 10% help you find 15%?* • *How does finding 10% help you find 20%?* • *If your bill is $12 and you want to leave a 15% tip, how much is the tip?* • *How did you find the amount for the tip?* Be sure to discuss whether the tip is different if they figured it before the sales tax had been added or after the tax had been	

added and what difference it would make.

Discuss the setting for Problem 4.2. **Have students work in groups of three or four.** Groups should fill out the lunch order to show what they planned to purchase and to show any computation that they do to answer the questions asked. Calculators should be available. You may wish to give each group an order form on transparency to fill out for the summary.

2. EXPLORE (20 minutes)

Teacher Notes

As the students work, encourage them to explore a variety of ways to solve this problem. Students might want to use a calculator to determine the food bill and tax, since this is often already computed for them when their bill is presented. However, we seldom have a calculator with us in a restaurant, so we need to develop efficient ways to find or estimate the amount of tip that should be left.

If students have a hard time with Question B, have them compute 15% of an amount and then compute 5% and 10% of the amount and add. The basic building block for understanding what is going on with percents is noting that 1% of an amount can be multiplied by 15 to find 15%, etc.

3. SUMMARIZE (15 minutes)

Teacher Notes

Have groups share their order and how they found the total bill including tax, what size tip they left and how they found it, and how they determined how much each person needs to pay to share the bill equally. Keep asking how the restaurant determines tax and how one can find the amount of tip to give.

Bits and Pieces III

Investigation 4, Problem 4.3

Finding Bargains

Mathematical Goals	**State Standards**
• Use percents in estimating or computing taxes, tips, and discounts. • Find what percent one number is of another number. • Solve problems using percents. **Vocabulary:** discount **Materials:**	

1. LAUNCH (10 minutes)	**Teacher Notes**
Calculators should be available for students. Have a conversation with your students about what it means when a store offers a sale or a discount on items. • *What does it mean when a store has a Saturday Special Sale and everything in the store is 25% off?* • *If everything is 25% off, what percent of the price do you have to pay?* • *If something costs $10 and there is a 25% off sale, how much do you have to pay for this item? How much do you save?* • *If something is $50 and there is a 25% off sale, how much do you have to pay for this item? How much do you save?* • *How did you find those amounts?* • *What percent of the original price do you pay?*	

Be sure students understand what Problem 4.3 is asking them to do. Some students find multi-step problems difficult. You might want to assign Question A and then discuss it with the class before they proceed to work on Questions B, C, and D. Have them **work with a partner to answer the questions.**

2. EXPLORE (20 minutes)

Teacher Notes

Remind them that they will need to explain their strategies to the rest of the class. Help students see how percent bars can be used to represent the problem.

Watch for the following misconception. In Question B, some students may think that 10% off one CD single means that if you buy three CD singles, you will get 30% off. If you see this misconception, you might ask,

- *If you buy 10 CD singles, what percent off would the store give you by your method? Is that reasonable?*

This should cause students to rethink.

Another question students ask is whether 10% off the whole is the same as 10% off each CD single. Here you can help students understand by asking them to compute each way and compare the answers.

3. SUMMARIZE (15 minutes)

Teacher Notes

Ask students to explain their strategies and to tell why they are reasonable.

If you have assigned Question A and discussed it before students proceed, this allows for some in-class practice with these ideas in a supportive manner. The ideas in these problems are difficult for some students because of the multiple steps needed to actually arrive at a solution. Question D can serve as a summary for the discussions that

have taken place in this unit up to this point. Be sure to end the summary with pulling together different strategies for thinking about percents. See the extended Summarize for discussion of strategies.	

Bits and Pieces III
Investigation 5, Problem 5.1
Clipping Coupons

Mathematical Goals	**State Standards**
• Develop a strategy for finding the percent of discount an amount taken off a price represents. • Use percents in estimating taxes, tips, and discounts. **Vocabulary:** **Materials:** PISD MSP Labsheet 5.1	

1. LAUNCH (10 minutes)	**Teacher Notes**
Raise interest in the problem by showing a page from a newspaper or magazine that has examples of coupons. The context should be familiar to them. Ask: • *What percent would I be saving if I used the coupon?* Let students talk about this for a minute or so and then turn them loose to work on the problem. Indicate that you will be asking them to describe their methods and whether they found one method that would work for all the problems. The introduction to the problem in the student edition gives an example that shows how thinking in pennies can be used as a way to handle decimals. You may want to skip this example and allow students to work on the coupon problem first, then share the strategy in the example. **Have students work in pairs.**	

2. EXPLORE (20 minutes)	**Teacher Notes**
As you observe the students working, encourage them to explore a variety of ways to solve the problem. If pairs are struggling, suggest they look back at the example given in the	

introduction to the problem.

Ask:

- *How do you find the fraction of the cost the coupon represents?*
- *Would knowing this help solve the problem?*

3. SUMMARIZE (15 minutes)

Teacher Notes

As a class, talk about all the ways student pairs found to solve the problem. Here are some strategies students have suggested:

Scott and Tandra realized that they could figure out how much they get off for each dollar, which would give them the part per hundred, or the percent. They said that since 300 pennies, or 3 dollars, is the whole, they could think of it as three groups of 100 pennies, or 1 dollar. For a discount of 75 cents, 25 cents applies to each $1.00, or 25 pennies to each 100 pennies. Thus the discount is the same as a 25% reduction.

Val and Lauren knew they could write 75 out of 300 as the fraction $\frac{75}{300}$. Then, they named an equivalent fraction, $\frac{25}{100}$, which is 25%.

Using a calculator, Raj and Terry handled 75 out of 300 as a division problem, 75 x 300, getting the decimal 0.25, which they knew could be represented as 25%.