A Curriculum Study: Teaching Integer Addition and Subtraction Using a Net Worth Concept

by

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Abstract

The face of mathematics education in the United States is currently undergoing a paradigm shift. After many years of applying the National Council of Teachers of Mathematics (NCTM) Standards, most states are now implementing the new set of national standards, The Common Core State Curriculum (CCSS). Because of this shift, teachers are working to align their materials with the practices and standards outlined in the CCSS. This thesis provides a discussion of the new CCSS and presents a unit plan for a seventh grade mathematics classroom on integer addition and subtraction. The unit plan provides an exemplar model of integer addition and subtraction and fulfills new requirements set forth in the CCSS. Using the concept of net worth, students have the opportunity to work within concrete scenarios and progressively move toward working with abstract number sentences detached of any context. This unit especially emphasizes the use of mathematical modeling, which is a particular piece in the CCSS.

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CHAPTER 1

Introduction

The face of education in the United States is constantly changing. Currently, forty-five states, the District of Columbia, and four territories have adopted The Common Core State Standards (CCSS) in their elementary, middle, and school classrooms (National Governors Association Center for Best Practices, 2010). The National Governors Association Center for Best Practices claims

> The Common Core State Standards provide a consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them. The standards are designed to be robust and relevant to the real world, reflecting the knowledge and skills that our young people need for success in college and careers. With American students fully prepared for the future, our communities will be best positioned to compete successfully in the global economy" (Common Core State Standards Initiative, 2012).

> This change from National Council of Teachers of Mathematics (NCTM) Standards to CCSS marks a paradigm shift in our educational system for our schools and suggests a move toward creating national standards. States are making an effort to provide a coordinating educational experience for students, no matter where they live. With the introduction of these new standards, many educators are faced with curriculum changes that must now be aligned with the newly implemented Common Core.

Problem Statement

Mathematics curriculums are being adjusted from grades Kindergarten all the way up through high school to meet the new demands of the CCSS. The academic year 2012-2013 marked the first year of the CCSS being implemented in classrooms across New York State (New York State Education Department, 2010). Because of the new curriculum standards, many teachers need to adjust previous lessons to meet the new requirements of the CCSS. The goal of this curriculum project thesis is to assist teachers in the adjustment to new standards being emphasized in the Common Core, such as mathematical modeling.

Purpose and Rationale

The goal of this curriculum project is to create a mini-unit on the topic of adding and subtracting integers for a seventh grade mathematics classroom aligned to the CCSS, and then implement it in the fall of 2013. The unit in this thesis will contain lessons that are engaging and use mathematical modeling to create deeper understanding of the process of adding and subtracting integers. In particular, the unit will use ideas of finance such as net worth, assets, and debts as well as vertical number lines to help students model and gain a conceptual understanding of this process. Early in the unit, the lessons will focus on concrete, contextual situations and then move into more conceptual problems, such as number sentences without any added context. After implementing the unit in a seventh grade classroom, the strengths and weaknesses of the unit will be examined and observations will be made about what could be improved or investigated for future research. The aim of this curriculum project is to help teachers implementing the CCSS in their classrooms to have a resource that accurately reflects

and meets the standards of the curriculum. While this particular curriculum study is fitted for a seventh grade classroom, it could easily be adjusted for implementation into a sixth or eighth grade classroom.

CHAPTER 2

Literature Review

History of the Common Core State Standards

On July 19, 2010, New York State officially adopted the Common Core State Standards (CCSS) as the foundation for its curriculum (New York State Education Department, 2011). Before this time, New York State was employing standards based on recommendations from the National Council of Teacher of Mathematics, which were then adjusted for New York State (NCTM). Previous to the CCSS, the NCTM led the way in guiding states to establishing standards for teaching mathematics. During the 1980s, the NCTM helped to develop a general mathematics curriculum in the United States (McLeod, 2003). However in recent years, research studies of mathematics education in high-performing countries have pointed to the conclusion that the mathematics curriculum in the United States must become substantially more focused and coherent in order to improve mathematics achievement in this country. To deliver on the promise of common standards, the standards must address the problem of a curriculum that is "a mile wide and an inch deep. These Standards are a substantial answer to that challenge" (National Governors Association Center for Best Practices, 2010).

Curriculum Shift

Because of this shift to the Common Core curriculum, different areas are now being emphasized versus what was formerly being stressed in the State Standards. "The main design principles in the New York State Common Core Learning Standards (CCLS) for Mathematics standards are focus, coherence, and rigor" (New York State Education Department, 2011). In

particular, the New York State Common Core outlines that there are six major shifts demanded in its curriculum: focus, coherence, fluency, deep understanding, application, and duel intensity (New York State Education Department, 2011).

One other area that the Common Core emphasizes that particularly sets it apart from the previous state standards is the value it places on mathematical modeling. Under the standard *CCSS.Math.Practice.MP4:* Mathematical Modeling, a description outlines what is expected of students in applying mathematical modeling to their learning.

> Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. …They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose (National Governors Association Center for Best Practices, 2010).

In the introduction of the New York CCSS for seventh grade, it describes that students ought to be "viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers" (New York State Education Department, 2011). For seventh grade, at least four Common Core Mathematics Standards are given that describe what is necessary for students' understanding of adding and subtracting integers. A complete description of these standards can be found in Chapter 3. Each of these four standards show the importance being placed on not only learning conceptually how to work with integers, but also how to apply mathematical modeling in real-world situations involving integer operations.

Integer Teaching Strategies

The subject of integers is a very important part of the middle school mathematics curriculum and it symbolizes a move from concrete to abstract thinking (Lamb & Thanheiser, 2006). Several methods or models exist to help assist student learning and encourage them to understand abstract ideas involved within integer calculations (Cemen, 1993). A few of the models include money, a number line, two-color tiles, and a number line (Cemen, 1993).

Cemen (1993) suggested that using a number line to teach integer addition and subtraction is the best method. She claimed the money model used the concept of receiving and giving money, but that it did a poor job of understanding negatives and subtraction. The two-color tile method was helpful in showing the addition and subtraction of integers, yet the process remained abstract in communicating the concept that subtracting three negative integers was the same adding three positive integers. Using the number line method, Cemen distinguishes between the rules needed for subtraction and addition on a number line. The sign of the number determines the direction to move on the number line, so for instance, a positive integer moves forward and a negative integer moves backward. Subtraction was demonstrated by using the concept of "turning around" on the number line. For example, when subtracting a negative number, that would imply that you turn around (face left) and then walk backwards, which is ultimately right and in the positive direction on the number line (Cemen, 1993).

Two other researchers, Lisa Lamb and Eva Thanheiser (2006) also created another method to help teach addition and subtraction of integers. These two researchers created a software called Balloons and Weights that helps attach concrete meaning to the abstract idea of negative and positive numbers (Lamb & Thanheiser, 2006). In summary, the software lets

balloons represent positive numbers or "going up" and weights or "pulling down" represent negative numbers. Using the concept of a hot air balloon, addition and subtraction of weights and balloons are performed. When more balloons are added than weights, the answer is positive. When more weights than balloons are added, the answer is negative. The operation of subtraction is demonstrated by "removal". So, when there is the subtraction of a negative integer, it is removing a negative, which shows it is the same as adding a positive integer. The researchers claim their software also helps students visualize or conceptualize what is happening when integers are added or subtracted (Lamb & Thanheiser, 2006).

Cobb (1986) looked at how a young student used different sophisticated and primitive methods to help with problem solving. While this particular article did not deal particularly with the actual action of addition and subtraction of negatives, it did look to understand how students create meaning and methods in their attempts at problem solving. The research examined how the student took preconceived ideas of solving a mathematical problem and then applied them to new situations. Sometimes there was success in using a previously known method, and other times, the student was left unsure in how to move forward in solving a problem.

In this particular case study, previously, the student had used a lot of manipulatives to help solve problems. When the student came upon a certain scenario that could not be figured out through the use of manipulatives, the student was stuck. Cobb (1986) commented how "unfortunate consequences can arise when a child is allowed to rely unduly on manipulatives." His observation is very apt when considering the ramifications of using manipulatives to teach the process of integer addition and subtraction.

Realistic Mathematics Education

While many integer pedagogies exist, it remains to be seen as to which method is best. As the CCSS are now being implemented in schools around the United States, authors Zawojewski, Magiera & Lesh (2013) critique that

> There is no discussion in the document [CCSS] to help the practitioner envision what the implementation of the intended curriculum will look like—leaving the accomplished curriculum more dependent on professional development and local school culture to fill in the picture (Zawojewski, Magiera & Lesh, 2013).

To help relieve the growing pressure of engaging in mathematical modeling and the need to fulfill the necessary mathematical practices outlined in the Common Core, the instructional theory of Realistic Mathematics Education (RME) is gaining traction for some researchers.

RME is a learning theory formulated in the early 1990's by respected Dutch mathematician, Freudenthal, who believed mathematics to be a, "human activity that combines learning and problem solving as a simultaneous activity" (Zawojewski, Magiera & Lesh, 2013). In particular, RME outlines that the progression of knowledge begins in a contextual, concrete scenario and then develops toward a more informal and abstract understanding, i.e. discovering connections between ideas, creating strategies to solve problems different ways, finding shortcuts. While this learning pattern may not be a "one size fits all" for students, using Vygotsky's classic "zone of proximal development" can be helpful in creating goals and scaffolding to help students engage with the content (Zawojewski, Magiera & Lesh, 2013).

Researcher Michelle Stephan (2009) lists three points that define Realistic Mathematics Education:

1. RME suggests that instruction start with an *experientially* real context for students, meaning that students do not have to have actually experienced the situation but have to be able to imagine themselves in it.

2. The work should build students' reasoning gradually from the concrete to the abstract. Teachers should use manipulatives, pictures, tools, and other items to reinforce students' reasoning with imagery, not just hope that students will think in the abstract by magic. Instruction should be intentionally designed so that students reorganize their thinking progressively toward more abstract ideas.

3. Students should be encouraged to create models of their concrete activity. These models should become reasoning devices for more abstract thinking. (Stephan, 2009)

RME Meets Integer Instruction

Two mathematics education researchers, Michelle Stephan and Didem Akyuz, recently collaborated to create an instructional theory for teaching integer addition and subtraction based on RME principles. Researchers Stephan and Akyuz (2012) conducted an experiment in a seventh grade classroom to "test and revise a hypothetical learning trajectory so as to propose a potential instructional theory." The contextual basis for their instruction was centered on the idea of net worth, particularly the affects of assets and debts. Through the use of this financial concept, instruction was mainly constructed through scenarios for the students to discuss the affects of assets and debts on net worth. Students were asked to model scenarios using symbols, but eventually the scenarios were stripped away and students were asked to evaluate number sentences outside of any context. Their findings after implementing this strategy led them to conclude that this type of learning model has "great potential" (Akyuz & Stephen, 2012).

CHAPTER 3

Unit Plan

The creation of this Unit Plan was inspired and guided mainly through the work of Stephen (2009), Akyuz (2012), and Akyuz & Stephen (2012). Each of these articles provided a skeleton of ideas that guided the construction of the following unit plan. Through their ideas, this curriculum was designed to build and add muscle to the parts provided and make a full-fledged, ready-to-use unit plan.

Table 1

Unit Calendar: Using Net Worth to Teach Integer Addition and Subtraction as per a 50-Minute Class Period

Day 1: Net Worth Assessments	Day 2: Comparing Net worth	Day 3: Comparing Net Worth Continued	Day 4: Using symbols to model transactions	Day 5: Transactions- using just symbols
Day 6: Review	Day 7: Final Assessment			

As with any provided unit plan, there is a degree of flexibility in implementing. More or less time could be taken with each day, respectively.

Daily Lesson Plan: **Day 1**

Lesson Title: Introduction to Net Worth

CCSS: 7.NS.A.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
        7.NS.A.1.d: Apply properties of operations as strategies to add and subtract rational numbers.

Objectives: (SWBAT)
- Understand that a net worth is found by adding up total assets and total debts and then subtracting
- Compare two different net worth situations using subtraction

Lesson Materials:
- Guided Notes: Net Worth Statement, Barbie/Ken Scenario, Day 1 Homework

Vocabulary:
- net worth
- asset
- debt

Introduction:
- Mention Justin Beiber has a net worth of $130 million. Ask "what does that mean"? Talk about what makes up a person's assets (cash, salary, properties) and debts (mortgages, credit card, etc.). List what Beiber's assets/debts might be. Go over net worth sheet. Define what an asset, debt, and net worth is.

Classroom Activities:
        Teach: Describe how a net worth is found through taking the different total assets and total debts. Have students find Ken and Barbie's individual net worth. Then, talk about and compare them using subtraction to say how much more one is worth than the other.

    Re-teach:
1. Students could struggle with understanding what an asset or debt is outside of cash. Explain it could be a house, or jewelry, or a valuable coin, credit card debt, etc.

Conclusion: Ask the students to explain in their own words what an asset, debt, and net worth is. Remind them it is found through subtracting total assets and debts.

Homework: Day 1 Homework Sheet

Reflection:

NET WORTH STATEMENT

Client Name:

Cash Assets

Cash Bank Account

Money Market Accounts

Other Cash

Investments

Bonds

Stocks

Mutual Funds

Annuities

IRAs

Retirement Plans

Real Estate

Other Investments

Personal Assets

Household Contents

Primary Residence

Automobiles

Other

Total Assets

Debts

Mortgages

Personal of Business Loan

Automobile Loans

Credit Card/Charge Accounts

Other Debts

Total Debts

NET WORTH

Net Worth Statement

Client Name: Barbie

Cash Assets   **CURRENT VALUE**

Checking Account

Money Market Account

Savings Account   **$80,000**

Investments

Restaurants   **$500,000**

Owns movie production
  Company   **$250,000**

Owns a book company   **$90,000**

Other

Personal Assets

Total Assets   [   ]

Debts

Boat Loan   **$200,000**

Penalty for pulling

  out of a movie deal   **$100,000**

Total Debts   [   ]

NET WORTH   [   ]

Net Worth Statement

Client Name: Ken

Cash Assets   **CURRENT VALUE**

Cash Bank Account   **$100,000**

Money Market Account

Savings Account

Investments

Owns retail stores   **$350,000**

Mutual Funds

Real Estate   **$600,000**

Other

Personal Assets

Car   **$115,000**

Other

Total Assets   [   ]

Debts

Engagement ring for
Barbie   **$90,000**

Auto Loans   **$300,000**

Total Debts   [   ]

NET WORTH   [   ]

CALCULATING AND COMPARING NET WORTH

Key Terms: Define each term using a complete sentence.

- **Assets:**

- **Debt:**

- **Net Worth:**

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1. Calculate Josh and Grace's net worth. **Who is worth more? By how much?**

Client: Josh   Client: Grace

Assets: **Assets:**

Cash Bank Account:	$10,000		Stocks:	$15,000
Real Estate: Tree House	$5,000		Real Estate: Mansion	$500,000
Retirement:	$50		Boat:	$100,000
Car: Lamborghini	$322,000		Car:	$3,000
Asset Total:			**Asset Total:**	

Debts: **Debts:**

Credit Card:	$1,000		Yacht Club Annual Membership Costs:	$20,000
Car Loan:	$320,000		House Mortgage	$400,000
Mortgage on tree house	$900		Boat Loan:	$88,000
			Credit Card:	$20,000
Debt Total:			**Debt Total:**	

NET
WORTH: **NET WORTH:**

Lesson Plan: **Day 2 and Day 3**

Lesson Title: Comparing Net Worth

CCSS: 7.NS.A.1.a: Describe situations in which opposite quantities combine to make 0.
7.NS.A.1.d: Apply properties of operations as strategies to add and subtract rational numbers.

Objectives: (SWBAT):
- Create and evaluate net worth statements
- Understand how assets can be represented using positive numbers and debts can be represented using negative numbers

Lesson Materials:
- Day 2 Notes, Day 3 Notes, Day 3 Homework

Vocabulary:
- Opposites

Introduction:
Day 2 and 3 Lessons have been combined because it truly varies on how long you would like the "Getting Started" activity to take. It could take half a class period, or an entire class period. There is a lot of flexibility in how long you would like to take in implementing these lessons, therefore the lesson plans are combined into one. Do what works best for your students/time frame. Begin by going over previous night's homework. Answer students' questions. Begin lesson with "Getting Started" Activity.

Classroom Activities:
Teach: Go over "The 3 Bachelors" example after students have discussed the net worth statements they've created. Make sure to comment on Bachelor 3 as having **opposite values** (-$20,000 and +$20,000) equaling zero. From there, talk about Example 2 and 3. Particularly emphasizing the various ways to calculate Sam's net worth in Ex 3.
Re-teach:
2. If students struggled with the homework from the night before, I will make sure they understand net worth is the difference of the assets and debts.
3. Students could struggle with accurately adding and subtracting all of the values.

Conclusion:
- Ask the students if there are multiple ways to calculate a net worth statement. (get their feedback)
- How can we represent an asset or a debt using symbols? (positive/negative numbers)

Homework: For Day 2: finishing their own net worth statement from the "Getting Started" activity.
For Day 3: Homework 3

Reflections:

COMPARING NET WORTH

GETTING STARTED: In your notebook, write and create your own net worth scenario for two people. List their assets and debts. Then, exchange it with a partner and have your partner determine the net worth of each person. (You could compare two professional athletes, celebrities, cartoon characters, or friends. Be creative!)

Today, we will be continuing our discussion of assets and debts and comparing net worth.

*How could you use an integer to represent an **asset** of $300?

*How could you use an integer to represent a **debt** of $550?

EXAMPLE 1:
If you were making a decision based on financial worth *only*, which bachelor would you choose to date? (A positive sign indicates an asset, a negative sign indicates a debt.)

Bachelor 1
Bank balance	+ $1,000
Car Loan	- $15,000
Boat Loan	- $45,000
Retirement Fund	+$60,000

Net Worth: $

Bachelor 2
Bank balance	+$10,000
Investment in offshore oil	+$25,000
Loss in stock market	- $50,000
Retirement fund	+$20,000

Net worth: $

Bachelor 3
Bank balance	- $100
Investment in energy-efficient fuel	+$20,000
Organic sweet potato farm	+$5,000
Stock market loss on mushrooms that power cars	- $20,00

Net worth: $

Day 3
EXAMPLE 2:

David has +$5,000 in assets and –$4,000 in debt. What is his net worth?

Daniel has +$30,000 in assets and –$35,000 in debt. What is his net worth?

How much greater is David's net worth than Daniel's?

Victoria has +$500 in assets and -$600 in debts. What is her net worth?

Melody has $200 in assets and -$150 in debts. What is her net worth?

How much greater is Melody's net worth than Victoria's?

EXAMPLE 3:

Sam's Worth Statement:

1. Asset 1: + $200

2. Asset 2: + $145

3. Debt 1: - $200

4. Debt 2: - $650

5. Asset 3: + $650

6. Asset 4: + $700

7. Debt 5: - $50

What is Sam's net worth?

Is there more than one way to calculate his net worth?

COMPARING NET WORTH

Calculate each person's net worth**.** Then, **compare** each pair's net worth and **tell** who is **worth more** and **by how much.**

1.   Victoria: +$500   David: +$500
                             −$300   +$400
                             +$700   −$800
                             −$500   −$200
    Net Worth: **Net Worth**:

2.   Melody: −$100   Grace: +$100
                             +$500   −$1000
                             −$600   +$400
                             +$200   +$500
    Net Worth: **Net Worth:**

3.   Josh: −$100   Sam: +$300
                             +$200   +$300
                             +$500   −$500
                             −$700   −$300
    Net Worth: **Net Worth**:

4.   Daniel: +$500   Miss Miller: −$500
                             −$900   −$800
                             +$800   +$400
                             −$100   +$600
    Net Worth: **Net Worth**:

Daily Lesson Plan: **Day 4**

Lesson Title: Transactions

CCSS: 7.NS.A.1.a: Describe situations in which opposite quantities combine to make 0.

7.NS.A.1.c: Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.

7.NS.A.1.d: Apply properties of operations as strategies to add and subtract rational numbers.

Objectives: (SWBAT)
- Describe the affects of transactions as good or bad on a net worth
- Begin using addition and subtraction symbols to represent a transaction

Lesson Materials:
- Day 4 Notes

Vocabulary:
- *Take away:* subtract
- *Add:* add
- Transaction

Introduction:
- Go over previous night's homework. Take any questions. Begin lesson with Example 1. Discuss how a net worth can be calculated without adding all of the debts and assets. It can be determined by the *taking away* or *adding* of a debt or asset from the overall net worth.

Classroom Activities:

Teach: Discuss how different transactions have a good or bad affect on net worth. (Make sure students understand what a transaction is.) Go over Example 2. Describe each situation as good or bad, then go back and symbolize each transaction. Take some extra time to talk about Melody's situation of "*taking away a debt*" and why that is a good thing and how to symbolize it: – (-). Part 2 of Ex: 2 looks at the reverse of students applying the language to symbols.

Re-teach:
- If students struggled with the homework from the night before, I will go over any questions they may be missed.

Conclusion: Have students finish with "Try It Out!". Let them work on their own and then talk about it together as a class when they have finished.

Homework: No homework

Reflections:

TRANSACTIONS

EXAMPLE 1:

Victoria lost an **asset** (a diamond necklace) worth **$6,000**. She wanted to figure out what she was worth now that the asset was taken away from her net worth. But, the only copy of her net worth statement that she could find has grape juice stains. Can you help her figure out her new net worth?

Victoria's Ne   **Statement:**

Asset: $
Asset: $
Asset: $9

Total A

Debt:
Debt: $
Debt: $

Total Debt:

Net Worth: $10,000

- ❖ Different transactions can have different affects on a person's net worth. Some can have a good affect, and others can have a bad affect. What do you think is meant by a "good affect"? "Bad affect"?

Example 2: Part 1

Which of the following students made good or bad decisions about their finances?

Victoria: She took away an asset of (+$200) from her net worth.

David: He added an asset of (+$3000) to his net worth.

Josh: He took away an asset of (+$50) from his net worth.

Sam: He added a debt of (-$650) to his net worth.

Melody: She took away a debt of (-$5400) from her net worth.

Daniel: He took away an asset of (+201) from his net worth.

Grace: She added a debt of (-$67) to her net worth.

Miss Miller: She took away an asset of (+$450) from her net worth.

How can we symbolize each transaction?

Part 2:
Now, describe each of the following transactions using the words *add, take away, debt,* or *asset.*

- $-(+\$300)$

- $+(-\$340)$

- $+(+\$534)$

- $-(-\$7404)$

Try It Out! : Work through the following three word problems on your own. Describe each financial situation as good or bad. Then, write each situation as a number sentence to find their net worth.

- Larry has a net worth of $300. A debt of $250 is *added.*
- Curly has a net worth of $5000. A debt of $3000 is *taken away.*
- Mo has a net worth of $20. An asset of $20 is *taken away.*

Daily Lesson Plan: **Day 5**

Lesson Title: Transactions Cont'd

CCSS: 7.NS.A.1.a: Describe situations in which opposite quantities combine to make 0.

7.NS.A.1.c: Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.

7.NS.A.1.d: Apply properties of operations as strategies to add and subtract rational numbers.

Objectives: (SWBAT)
- Create number sentences based on a scenario
- Begin to solve integer operations stripped of any context.
- Use a Vertical Number Line to help model a situation

Lesson Materials:
- Day 5 Notes and Day 5 Homework

Introduction: Begin with the Getting Started activity. Students can work individually or in pairs to answer the questions. Then, go over the questions, reviewing the concept of *take away* and *add* and its affect on net worth.

Classroom Activities:

Teach: Discuss how using a Vertical Number Line (VNL) can be helpful in modeling the action of a transaction on a net worth. Model for the students how to use a VNL in Ex: 1. Have the students work through each of the problems using a VNL and writing number sentences for each scenario. Let the students guide the discussion. Eventually, work through to Ex: 2 where the context is slowly stripped away.

Re-teach: Students could struggle with moving out of concrete contexts and scenarios into abstract number sentences. Encourage students to create their own story for a problem if there is no context. Remind them a subtraction sign means *take away* and addition means *add*.

Conclusion: Have the students write a number sentence and exchange it with a partner. Then, have them check to see if they got it correct. Check to make sure the students evaluated them correctly.

Homework: Day 5 Homework

Reflections:

TRANSACTIONS Cont'd

GETTING STARTED: Describe each financial situation as good or bad. Then, write each situation as a number sentence to find their net worth.

- Mario has a net worth of $600. A debt of $300 is *added*.

- Luigi has a net worth of $100. A debt of $200 is *taken away*.

- Princess Peach has a net worth of $1000. An asset of $500 is *taken away*.

- Yoshi has a net worth of $10. An asset of $4 has been *added*.

What about someone who has a net worth that is negative? How do assets and debts affect their net worth?

Using a vertical number line (VNL) can also be helpful in modeling the situation and showing the affects of debt or assets on the net worth.

Example 1:

Big Bird has a net worth of -$500. He has an asset of $700 *added*. What is his net worth now? Model this with a VNL, and write as a number sentence.

Oscar the Grouch has a net worth of -$1000. He has an asset of $500 *taken away*. What is his net worth? Model this scenario with a VNL and write this as a number sentence.

Grover has a net worth of -$50. He has an debt of $300 *taken away*. What is his net worth? Model this scenario with a VNL and write this as a number sentence.

Ernie has a net worth of -$350. He has a debt of $550 *added.* What is his net worth? Model this scenario with a VNL and write this as a number sentence.

Example 2: Write each scenario as a number sentence to determine net worth.

1. Elmo has a net worth of -$7400. An asset of $3000 is taken away. Is this good or

    bad? What is his net worth?

2. Net worth: $1500; transaction: adds a debt of $600.

3. $45: add an asset of (+$5)

4. 360; add (-160)

5. - $90 – (-$100)

6. -50 – (-50)

7. -3+4 - (-23) -10

NAME:_____   Day 5: Homework

Directions: Write each scenario as a number sentence to find the net worth.
(Helpful Hint: Use a Vertical Number Line to help you model the situation if you're stuck.)

1. Peter has a net worth of $5000. An asset of $6000 is taken away. What is his net worth?

2. James has a net worth of -$100. A debt of $300 is added. What is his net worth?

3. Net worth: $2300; transaction: a debt of $600 is added.

4. Net worth: -$240: transaction: an asset of $500 is added.

5. $30: add (-$25)

6. $-40 - (-40)$

7. $-5 + (-20)$

8. $12 - 17$

9. $-5 + (-6) - 1 + 5$

10. $20 + (-4) - 3 + 12$

Lesson Title: Review of Integer Addition and Subtraction

CCSS: 7.NS.A.1.a: Describe situations in which opposite quantities combine to make 0.

7.NS.A.1.c: Understand subtraction of rational numbers as adding the additive inverse, $p – q = p + (–q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.

7.NS.A.1.d: Apply properties of operations as strategies to add and subtract rational numbers.

Objectives: (SWBAT)
- Practice Integer Addition and Subtraction outside of any context through an activity.

Lesson Materials:
- 1 dice per person
- 1 coin per person
- Copies of activity worksheet cut into fourths (enough for each student for at least 3 rounds)

Introduction:
- Go over previous night's homework. Take any questions the students may have. Tell the students that today we're going to do an activity to help practice doing integer addition and subtraction called "Flipping for Integers" (from the NCTM website http://illuminations.nctm.org/LessonDetail.aspx?ID=L734)

Classroom Activities:

Teach: Rules of the Game: (These were taken directly from NCTM website):

- Flip the coin and roll the die.
- The number rolled is used by the player in that turn.
- If the coin is HEADS, then the number is POSITIVE
- If the coin is TAILS, then the number will be NEGATIVE
- The player writes the signed number in any blank on the data sheet that he or she chooses and evaluates the expression created in that row and writes the value in the third column.

> EXAMPLE: A student rolls a tail and a five, then that student has to put -5 somewhere.
> After each player has had 10 turns, they should check their arithmetic for each of the 10 sums they generated by rolling the die (and flipping the coin). Whoever has the highest sum wins. (Silver, 2007)

Re-teach: If students struggled with the homework from the night before, I will go over any questions they may have to make sure they have an understanding of the correct answer.

Conclusion: Ask students about different strategies they had to help them maximize their points. Time-permitting: a "face-off" with the two students who had the highest scores.

Homework: If it seems the students need more practice, any worksheet from http://www.math-drills.com/integers.shtml for integer addition and subtraction will be useful.

Reflection:

NAME: _____

ROW	EXPRESSION	VALUE
1	1 + (__)	
2	2 − (__)	
3	3 + (__)	
4	3 − (__)	
5	4 + (__)	
6	4 − (__)	
7	5 + (__)	
8	5 − (__)	
9	6 + (__)	
10	6 − (__)	

TOTAL:_____

NAME: _____

ROW	EXPRESSION	VALUE
1	1 + (__)	
2	2 − (__)	
3	3 + (__)	
4	3 − (__)	
5	4 + (__)	
6	4 − (__)	
7	5 + (__)	
8	5 − (__)	
9	6 + (__)	
10	6 − (__)	

TOTAL:_____

NAME: _____

ROW	EXPRESSION	VALUE
1	1 + (__)	
2	2 − (__)	
3	3 + (__)	
4	3 − (__)	
5	4 + (__)	
6	4 − (__)	
7	5 + (__)	
8	5 − (__)	
9	6 + (__)	
10	6 − (__)	

TOTAL:_____

NAME: _____

ROW	EXPRESSION	VALUE
1	1 + (__)	
2	2 − (__)	
3	3 + (__)	
4	3 − (__)	
5	4 + (__)	
6	4 − (__)	
7	5 + (__)	
8	5 − (__)	
9	6 + (__)	
10	6 − (__)	

TOTAL:_____

Daily Lesson Plan: **Day 7**

Lesson Title: Final Assessment of Integer Addition and Subtraction Unit

CCSS: 7.NS.A.1: Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

        7.NS.A.1.a: Describe situations in which opposite quantities combine to make 0.

        7.NS.A.1.c: Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.

        7.NS.A.1.d: Apply properties of operations as strategies to add and subtract rational numbers.

Objectives: (SWBAT)
- Show what they have learned in understanding how to add/subtract integers inside and outside of any context.

Lesson Materials:
- Copies of Final Assessment

Introduction:
- If students completed any homework, such as a worksheet from mathdrills.com, go over it and take any questions. Do a few practice problems, and briefly review before allowing students to take test.

Classroom Activities:
- Take a math test
- Students can take the rest of the class period to do assessment
- If done early, they can work on other schoolwork or get out a book to read quietly.

Conclusion:
- Remind students that there is no homework tonight.

Homework: No Homework

Reflections:

NAME:_____

Finding Net Worth: Adding and Subtracting Integers Exam

Directions: Calculate the net worth for each person.

1. Client: Tim Tebow   **Client: Drew Brees**

Assets:	
Nike Endorsement	$30,000
House	$500,000
Heisman Trophy	$100,000
Debts:	
Mortgage	$200,000
Orphanage in the Philippines	$150,000
Net Worth:	

Assets:	
Weekly Salary	$380,000
Endorsements	$200,000
Super Bowl Ring	$420,000
Debts:	
Funding The Drew Brees Foundation	$200,000
Credit Card Debt	$50,000
Net Worth:	

2. Matthew has $500,000 in assets and $30,000 in debts. What is his net worth?

3. Mark has $40,000 in assets and $50,000 in debts. What is his net worth?

4. Luke has $20 in assets and $45 in debts. What is his net worth?

5. John has $53 in assets and $53 in debts. What is his net worth?

5. Directions: Which of the following dwarves made good or bad decisions about their finances? Write a number sentence to find their net worth

Happy: He has a net worth of $500. He t*ook away* an asset of (+$200).

Sneezy: He has a net worth of -$1000. He *added* an asset of (+$3000).

Sleepy: He has a net worth of $75. He *took away* an asset of (+$50).

Dopey: He has a net worth of $100. He *added* a debt of (-$650).

Grumpy: He has a net worth of -$200. He *took away* a debt of (-$5400).

Bashful: He has a net worth of -$50. He *took away* an asset of (+200).

Doc: He has a net worth of $40. He added a debt of (-$67).

Snow White: She has a net worth of $675. She *took away* an asset of (+$450).

6. Directions: Add or subtract to determine each net worth.

8. Net worth: $1500; adds a debt of $600.

9. $45: add an asset of (+$5)

10. 360 + (-160)

11. $90 − (−$100)

12. −50 − (−50)

13. 25 − 45

14. −13 + (−12)

8. $31 − (−17)$

9. $(−20) + 41$

10. $5 + (−40)$

BONUS: A. $−5 + (−3) − (−8) + 12$ **B.** $43 − (−6) + 7 − 20$

CHAPTER 4

Validity of Curriculum

Being a current teacher, the author of this curriculum and this thesis was able to implement this curriculum in her seventh grade classroom. The seventh grade class was small and only had seven students in it. Despite being a small class, the students had a wide range of abilities. Most of them were able to learn new concepts fairly quickly, however, two students in particular tended to struggle in learning new mathematical ideas. The structure of this curriculum was also fairly different from the usual flow that the regular curriculum followed which could have created another potential challenge.

Overall, the students responded well to this curriculum. They enjoyed the creative aspects of writing their own net worth scenarios as well as the stories surrounding many of the problems. The students themselves were written into a lot of the problems and were included in scenarios, which especially seemed to engage and capture their interest. They also took really well to the language of the curriculum and were able to understand and describe the concept of what an asset or debt was. In particular, they did really well in understanding the affects of transactions on a net worth.

The idea of the affects of transactions on net worth proved to be one of the most powerful ideas in communicating operational integer concepts. Two days of the curriculum (Day 4 and Day 5) were spent examining how adding a debt/asset or taking away a debt/asset affects net worth. Through different scenarios, the students described the transaction as having either a good affect or a bad affect on net worth even before any calculating took place. This descriptive process was especially helpful in ultimately understanding why subtracting a negative number creates a more positive answer.

Using the language of net worth, this particular scenario from Day 4 proved a crucial point: "**Melody**: She took away a debt of (-$5400) from her net worth". The students readily agreed that taking away a debt was a good thing and that the result would have a positive affect on net worth. They also agreed it could be modeled as – (-$5400). The power of this statement is that it takes an extremely deep and abstract concept of why subtracting a negative value creates a more positive answer and places it within a context that makes it practical and accessible for students to understand. Many integer pedagogies break down or get tripped up in communicating this particular concept to students and ultimately create more confusion than clarity, but this curriculum particularly allowed for that concept to be clearly explained and understood.

It was helpful that the curriculum started out using concrete scenarios and then slowly stripped away the context and moved into the abstract. This progression of slowly removing the context helped students make that step of transferring their learning from concrete situations to creating a more conceptual understanding of integer addition and subtraction. The gradual process made it a little easier for students to begin working in terms of only number sentences, instead of a direct jump into the abstract.

Finally, and perhaps most importantly, there has been a lasting, positive effect of this curriculum. After the implementation of this curriculum, the students' next area of study was working on how to solve algebraic equations involving integers. This process, of course, requires them to readily add and subtract negative and positive numbers in order to isolate the variable, and solve the equation. The students have been able to take the concepts they learned in this curriculum and successfully transfer their learning to solving algebraic equations. This demonstrates the true mark of an effective curriculum; transferring a concept from one area to another, and executing it successfully.

CHAPTER 5

Final Reflections

Because of the shift the Common Core State Standards, mathematics teachers across the United States have been scrambling to find units that teach appropriate content as well as meet the rigorous new standards. The unit plan outlined in this thesis seeks to be a tool for teachers to be able to use in their classroom that meets those requirements within the particular topic of integer addition and subtraction. This unit was written specifically for a seventh grade mathematics class, although it could easily be adjusted for a sixth or eight grade classroom.

After examining the many ways that exist for helping to model integer addition and subtraction, this unit particularly focused on using a net worth concept. Using the idea of assets as positive numbers and debts as negative numbers, scenarios were created that allowed for students to model situations. The concept of a transaction occurring on a net worth, such as the adding or taking away of a debt or asset proved to be helpful in understanding how to properly execute integer addition and subtraction.

Eventually, contexts were taken away and students were left with basic number sentences detached of any specific context to solve. For most students, the step from the concrete into the abstract went smoothly. However, there were some students who did very well within a context, but then struggled when the scenario was taken away. They had difficulty in transitioning from the concrete to the abstract. Perhaps, more time should have been given for students to make that transition or more scaffolding should have been built in to help them make that shift into the abstract from the concrete. Either way, in the future, it will be important to create as much support as possible for students as they make that shift, which can be very challenging for some.

Ultimately, this unit plan served its role well in equipping students to understand at a deeper level what is meant when integers are added and subtracted. It is not because of rules memorized, but because of concepts visualized. Through the idea of net worth, integer addition and subtraction could be understood at a higher degree, which then helped create a lasting learning experience.

Net Worth Statement

Client Name: Barbie		**Client Name: Ken**	
Cash Assets	**CURRENT VALUE**	**Cash Assets**	**CURRENT VALUE**
Checking Account		Cash Bank Account	$100,000
Money Market Account		Money Market Account	
Savings Account	$80,000	Savings Account	
Investments		**Investments**	
		Owns retail stores	$350,000
Restaurants	$500,000		
Owns movie production		Mutual Funds	
Company	$250,000	Real Estate	$600,000
		Other	
Owns a book company	$90,000	**Personal Assets**	
		Car	$115,000
Other		Other	
Personal Assets			
		Total Assets	$1,165,000
Total Assets	$920,000		
Debts		**Debts**	
		Engagement ring for	
Boat Loan	$200,000	Barbie	$90,000
Penalty for pulling			
out of a movie deal	$100,000	Auto Loans	$300,000
Total Debts	$300,000	**Total Debts**	$390,000
NET WORTH	$620,000	**NET WORTH**	$775,000

WHO IS WORTH MORE?
BY HOW MUCH?
Ken is worth $155,000 more than Barbie.
NAME:_____

Day 1: Homework

CALCULATING AND COMPARING NET WORTH

Key Terms: Define each term using a complete sentence.

- **Assets:** Assets are anything of value that can be converted into cash.

- **Debt:** Debt is something that is owed or due.

- **Net Worth:** Net worth is total assets minus total debts.

---

1. Calculate Josh and Grace's net worth. **Who is worth more? By how much?**

Client: Josh   Client: Grace

Assets: **Assets:**

Cash Bank Account: $10,000			Stocks:	$15,000	
Real Estate: Tree House $5,000			Real Estate: Mansion $500,000		
Retirement: $50			Boat: $100,000		
Car: Lamborghini $322,000			Car: $3,000		
Asset Total: $337,050			**Asset Total: $618,000**		

Debts: **Debts:**

Credit Card: $1,000		Yacht Club Annual Membership Costs: $20,000
Car Loan: $320,000		House Mortgage $400,000
Mortgage on tree house $900		Boat Loan: $88,000
		Credit Card: $20,000
Debt Total: $321,900		**Debt Total: $528,000**

NET WORTH: $15,150   **NET WORTH: $90,000**

Grace is worth $74,850 more than Josh

Appendix B: Day 2+3 Solutions

NAME: _____   Day 2+3: Notes

COMPARING NET WORTH

This Getting Started activity could be done briefly or used for an entire class period.

GETTING STARTED: In your notebook, write and create your own net worth scenario for two people. List their assets and debts. Then, exchange it with a partner and have your partner determine the net worth of each person. (You could compare two professional athletes, celebrities, cartoon characters, or friends. Be creative!)

Today, we will be continuing our discussion of assets and debts and comparing net worth.

*How could you use an integer to represent an **asset** of $300? +$300

*How could you use an integer to represent a **debt** of $550? -$550

EXAMPLE 1:
If you were making a decision based on financial worth *only*, which bachelor would you choose to date? (A positive sign indicates an asset, a negative sign indicates a debt.)

Bachelor 1
Bank balance	+ $1,000
Car Loan	- $15,000
Boat Loan	- $45,000
Retirement Fund	+$60,000

Net Worth: $ 1,000

Bachelor 2
Bank balance	+$10,000
Investment in offshore oil	+$25,000
Loss in stock market	- $50,000
Retirement fund	+$20,000

Net worth: $ 5,000

Bachelor 3
Bank balance	- $100
Investment in energy-efficient fuel	+$20,000
Organic sweet potato farm	+$5,000
Stock market loss on mushrooms that power cars	- $20,000

Net worth: $ 4,900   **Bachelor 2 is worth the most.**

DAY 3
EXAMPLE 2:

David has +$5,000 in assets and –$4,000 in debt. What is his net worth?
        $1,000

Daniel has +$30,000 in assets and –$35,000 in debt. What is his net worth?
   -$5,000

   How much greater is David's net worth than Daniel's?

      $6,000

Victoria has +$500 in assets and -$600 in debts. What is her net worth?
   -$100

Melody has $200 in assets and -$150 in debts. What is her net worth?
   $50
   How much greater is Melody's net worth than Victoria's?
      $150

EXAMPLE 3:

Sam's Worth Statement:

1. Asset 1: + $200

2. Asset 2: + $145

3. Debt 1: - $200

4. Debt 2: - $650

5. Asset 3: + $650

6. Asset 4: + $700

7. Debt 5: - $50

What is Sam's net worth? **$795**

Is there more than one way to calculate his net worth?
   - **Add up assets, then add debts, subtract**
   - **Cross out opposite (+20,000 & -20,000) then combine assets/debts**
   - **Take it one at a time, asset, debt, asset, etc.**
NAME: _____   Day 3: Homework

COMPARING NET WORTH

Calculate each person's net worth**. Then, **compare** each pair's net worth and **tell** who is **worth more** and **by how much.**

1. Victoria: +$500   David: +$500
                −$300   +$400
                +$700   −$800
                −$500   −$200
    Net Worth: **$400**   **Net Worth**: -**$100**

Victoria is worth $500 more than David.

2. Melody: −$100   Grace: +$100
                +$500   −$1000
                −$600   +$400
                +$200   +$500
    Net Worth:$0   **Net Worth: $0**

Melody and Grace both have the same net worth of $0.

3. Josh: −$100   Sam: +$300
                +$200   +$300
                +$500   −$500
                −$700   −$300
    Net Worth:-$100   **Net Worth:-$200**

Josh is worth $100 more dollars than Sam.

4. Daniel: +$500   Miss Miller: −$500
                −$900   −$800
                +$800   +$400
                −$100   +$600
    Net Worth:$300   **Net Worth**: **-$300**

Daniel is worth $600 more than Miss Miller
Appendix C: Day 4 Solutions

NAME: _____   Day 4:
Notes

TRANSACTIONS

<u>EXAMPLE 1</u>:

Victoria lost an **asset** (a diamond necklace) worth **$6,000**. She wanted to figure out what she was worth now that the asset was taken away from her net worth. But, the only copy of her net worth statement that she could find has grape juice stains on it. Can you help her figure out her new net worth?

Victoria's Ne**Statement:**

Asset: $
Asset: $
Asset: $9

Total A

Debt:
Debt: $
Debt: $

Total Debt:

Net Worth: $10,000

$10,000 – ($8000) = $2,000

❖ Different transactions can have different affects on a person's net worth. Some can have a good affect, and others can have a bad affect. What do you think is meant by a "good affect"? "Bad affect"?

Good affect: increases net worth
Bad affect: decreases net worth

Example 2: Part 1

Which of the following students made good or bad decisions about their finances?

Victoria: She took away an asset of (+$200) from her net worth. **bad; -(+200)**

David: He added an asset of (+$3000) to his net worth. **good; +(+3000)**

Josh: He took away an asset of (+$50) from his net worth. **bad; -(+50)**

Sam: He added a debt of (-$650) to his net worth. **bad; +(-650)**

Melody: She took away a debt of (-$5400) from his net worth. **good; -(-5400)**

Daniel: He took away an asset of (+201) from his net worth. **bad; -(+201)**

Grace: She added a debt of (-$67) to her net worth. **bad; +(-67)**

Miss Miller: She took away an asset of (+$450) from her net worth. **bad; -(+450)**

How can we symbolize each transaction?

Part 2:
Now, describe each of the following transactions using the words *add, take away, debt,* or *asset.*

- $-(+\$300)$ **take away a $300 asset**

- $+(-\$340)$ **add a $340 debt**

- $+(+\$534)$ **add a $534 debt**

- $-(-\$7454)$ **take away a debt of $7454**

Try It Out! : Work through the following three word problems on your own. Describe each financial situation as good or bad. Then, write each situation as a number sentence to find their net worth.
- Mo has a net worth of $300. A debt of $250 is *added.* **bad; 300 + (-250) = $50**

- Harry has a net worth of $5000. A debt of $3000 is *taken away.*
  good; 5,000 - (-3,000)=$8,000
- Curly has a net worth of $20. An asset of $20 is *taken away.* **bad; 20 – (+20) = $0**

Appendix D: Day 5 Solutions

NAME: _____   Day 5:
Notes

TRANSACTIONS Cont'd

GETTING STARTED: Describe each financial situation as good or bad. Then, write each situation as a number sentence to find their net worth.

- Mario has a net worth of $600. A debt of $300 is *added*.
  bad; 600 + (-300) = $300
- Luigi has a net worth of $100. A debt of $200 is *taken away.*
  good; 100 - (-200) = $300
- Princess Peach has a net worth of $1000. An asset of $500 is *taken away.*
  bad; 1,000 – (+500) = $500
- Yoshi has a net worth of $10. An asset of $4 has been *added.*
  good; 10 + (+14) = $14

What about someone who has a net worth that is negative? How do assets and debts affect their net worth?

Using a vertical number line (VNL) can also be helpful in modeling the situation and showing the affects of debt or assets on the net worth.

Example 1:

Big Bird has a net worth of -$500. He has an asset of $700 *added*. What is his net worth now? Model this with a VNL, and write as a number sentence.

   - 500 + (+700) = $200

Oscar the Grouch has a net worth of -$1000. He has an asset of $500 *taken away*. What is his net worth? Model this scenario with a VNL and write this as a number sentence.

   - 1,000 – (+500) = - $1500

Grover has a net worth of -$50. He has an debt of $300 *taken away.* What is his net worth? Model this scenario with a VNL and write this as a number sentence.

   -50 – (- 300) = $250

Ernie has a net worth of -$350. He has a debt of $550 *added.* What is his net worth? Model this scenario with a VNL and write this as a number sentence.

- 350 + (-550) = $900

Example 2: Write each scenario as a number sentence to determine net worth.

1. Elmo has a net worth of -$7400. An asset of $3000 is taken away. Is this good or

   bad? What is his net worth? **bad; - 7,400 – (+3,000) = - $10,400**

2. Net worth: $1500; transaction: adds a debt of $600. **1500 + (-600) = $900**

3. $45: add an asset of (+$5) **45 + (+5) = $50**

4. 360; add (-160) **360 + (-160) = 200**

5. - $90 – (-$100) **= $10**

6. -50 – (-50) = **$0**

7. -3+4 - (-23) -10 **= 1**

NAME:_____   Day 5: Homework

Directions: Write each scenario as a number sentence to find the net worth.
        (Helpful Hint: Use a Vertical Number Line to help you model the situation if
        you're stuck.)

1. Peter has a net worth of $5000. An asset of $6000 is taken away. What is his net
   worth?

                    5000 – (+6000) = - $1000

2. James has a net worth of -$100. A debt of $300 is added. What is his net worth?

- 100 + (-300) = - $400

3. Net worth: $2300; transaction: a debt of $600 is added.

2300 + (-6000) = $1700

4. Net worth: -$240: transaction: an asset of $500 is added.

- 240 + (+500) = $260

5. $30: add (-$25)

30 + (-25) = $5

6. $-40 - (-40) =$ **0**

7. $-5 + (-20)$ **= - 25**

8. $12 - 17 =$ **- 5**

9. $-5 + (-6) - 1 + 5$ **= - 7**

10. $20 + (-4) - (-3) + 12$ **= 31**

Appendix E: Day 7 Solutions

NAME:_____

Finding Net Worth: Adding and Subtracting Integers Exam

Directions: Calculate the net worth for each person.

1. Client: Tim Tebow   **Client: Drew Brees**

Assets: $630,000	
Nike Endorsement	$30,000
House	$500,000
Heisman Trophy	$100,000
Debts: $350,000	
Mortgage	$200,000
Orphanage in the Philippines	$150,000
Net Worth: $280,000	

Assets: $1,000,000	
Weekly Salary	$380,000
Endorsements	$200,000
Super Bowl Ring	$420,000
Debts: $250,000	
Funding The Drew Brees Foundation	$200,000
Credit Card Debt	$50,000
Net Worth: $750,000	

2. Matthew has $500,000 in assets and $30,000 in debts. What is his net worth?

$470,000

3. Mark has $40,000 in assets and $50,000 in debts. What is his net worth?

- $10,000

3. Luke has $20 in assets and $45 in debts. What is his net worth?

- $25

4. John has $53 in assets and $53 in debts. What is his net worth?
$0

5. **Directions:** Which of the following dwarves made good or bad decisions about their finances? Write a number sentence to find their net worth

Happy: He has a net worth of $500. He t*ook away* an asset of (+$200).
bad; 500 – (+200) = $300

Sneezy: He has a net worth of -$1000. He *added* an asset of (+$3000).
good; -$1000 + (+3000) = $2000

Sleepy: He has a net worth of $75. He *took away* an asset of (+$50).
bad; 75 – (+50) = $25

Dopey: He has a net worth of $100. He *added* a debt of (-$650).
bad; 100 + (-650) = - $550

Grumpy: He has a net worth of -$200. He *took away* a debt of (-$5400).
good; - 200 – (-5400) = $5200

Bashful: He has a net worth of -$50. He *took away* an asset of (+200).
bad; -50 – (+200) = - $250

Doc: He has a net worth of $40. He added a debt of (-$67).
bad; 40 + (- 67) = -$27

Snow White: She has a net worth of $675. She *took away* an asset of (+$450).
bad; 675 – (+450) = $225

6. Directions: Add or subtract to determine each net worth.

1. Net worth: $1500; adds a debt of $600.
   1500 + (-600) = $900
2. $45: add an asset of (+$5)
   45 + 5 = $50
3. 360 + (-160)
   200
4. $90 − (−$100)
   190
5. −50 − (−50)
   0
6. 25 − 45
   -20
7. −13 + (−12)
   -25

8. $31 − (−17)$ **48**

9. $(−20) + 41$ **21**

10. $5 + (−40)$ **- 25**

BONUS: A. $−5 + (−3) − (−8) + 12$
12

B. $43 − (−6) + 7 − 20$
36

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