Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

DETAILED LESSON PLAN: STEALING HOME

How many runs will Jackie Robinson likely score in the 1948 season?

Percents come up repeatedly in everyday life and knowing how they work will prove to be very useful. In *Stealing Home*, Margie and Ed work at the Chicago Daily News and decided to do a story on the new baseball player that has everyone talking: Jackie Robinson. In the piece, they attempt to predict how many runs he will have in the 1948 season. The data provided are an image of Jackie Robinson stating that he is expected to get on base 210 times, and another image of stating that once on base, he scores 52% of the time.

Lesson Plan Overview

Lesson Length: 4 Days

Prerequisite Standards

- 6.RP.A.2

Vocabulary

- **Part:** A portion of the whole.
- **Whole:** 100% of a quantity.
- **Percent:** A rate per 100.

Vocabulary Protocols:

- In your math classroom, make a Word Wall to hang and refer to vocabulary words throughout the lesson. As a whole-class exercise, create a visual representation and definition once students have had time to use their new words throughout a lesson.
- In the *Practice Printable*, remind students that key vocabulary words are highlighted. Definitions are available at the upper right in their student account.
- In the *Student Reflection*, the rubric lists the key vocabulary words for the lesson. Students are required to use these vocabulary words to explain, in narrative form, the math experienced in this lesson. During "Gallery Walks," vocabulary can be a focus of the "I Wonder..., I Notice..." protocol.

Applying Standards for Mathematical Practice

SMP 2 **Reason abstractly and quantitatively.**
During *Data & Computation, Practice Printable*, and *Clicker Quiz*, students must make sense of the quantities presented in real-world situations to identify what "piece" of the percent relationship they represent. Then students must decontextualize those quantities to compute to the unknown value, and finally contextualize the meaning of the unknown value in the real-world situation..

SMP 5 **Use appropriate tools strategically.***
During *Data & Computation* and *Practice Printable*, students discover that two parts of a percent problem are given (whole, part, or percent) and a third unknown part must be determined. Students can use different tools that help them see that 100% splits up into parts (double number lines, tape diagrams, ratio tables, etc.).

Mathematical Practice Tip from Jo Boaler: SMP 5

The important words in the description of this mathematical practice are – students *consider* the available tools. When students leave school and enter the workplace they will not be told which tools to use they will be expected to consider different tools and select the most useful.

Take some class time once in awhile to focus just on the variety of tools and their mathematical properties. These "tool sessions" help students develop important metacognitive thinking. More traditional tools may be digital (e.g. general spreadsheets or specialized geometry software) or may be hands-on (e.g. grid paper, white paper, colored pencils, rulers, protractors, compasses, counters, blocks, etc.). Other types of tools are mathematical representations (e.g. graphs, tables, number lines, tape diagrams, box plots, histograms, etc.) that are advantageous in different ways.

Before a lesson begins, I sometimes like to remind my students of what they have at their disposal, both hands-on tools and mathematical representations that can serve as tools. In my own teaching of middle school students I encouraged students to choose and use different tools – such as iPads and calculators – whenever they encountered a need.

Here are some recommendations:

1. Think about the tools that you could make available for each lesson – how could they help students in their problem solving and how can students access them?
2. In lessons that offer opportunities for students to choose a tool, some great prompts are:
   - *What are the strengths and limitations of _____?*
   - *What type of representation is going to help us solve this?*
   - *Is there another tool that may be helpful to _____?*
3. When students ask you a question, such as "How do I find a perimeter?" or "What is a model?" encourage them to find out for themselves, using tech tools and search engines.
4. When students tell you they are stuck or don't know how to go forward, ask them – *What tool could you use that would help you?*

Video: Conrad Wolfram presents a vision for mathematics teaching that centralizes mathematical tools.
(Run time: 1 hr, 17 min, 13 sec)
https://www.youcubed.org/resources/fundamentally-fixing-maths-education/

Cluster Connection

Cluster Heading: Understand ratio concepts and use ratio reasoning to solve problems.

- **Direct Connection:** In *Stealing Home,* students will find the number of runs scored by Jackie Robinson by using ratio reasoning to calculate a percent of the number of times he gets on base.
- **Cross-Cluster Connection:** This activity connects 6.RP.A to 7.RP.A where students will again use the concept of percent to solve problems around simple interest, tax, markups and markdowns, gratuities and commissions, percent increase and decrease, and percent error.

Common Misconceptions

- Students may not change the percent to a decimal when the percent value already contains a decimal. Encourage students to write the percent value over 100 then divide by 100 (or move the decimal).
- Students may misidentify the part and/or whole. Encourage students to draw a visual and label the parts.

Supporting Diverse Learners

Accommodations, Modifications and Extensions for English Learners (EL) and Special Populations

These supports may be appropriate for all students. Accommodations, modifications, and extensions are provided by curriculum component. Please consider additional supports where you find them appropriate for your students.

Note: Strategies contained in this section are appropriate for English Learners and students who are receiving services under the Federal Individuals with Disabilities Education Act (IDEA), Section 504 of the Rehabilitation Act of 1973, and state laws governing Talented and Gifted education.

Component	Accommodations/Modifications	Extensions
Test Trainer Pro	*Test Trainer Pro* automatically adapts to student ability level as students move through questions. Instruct students to work in a lower grade level or Core Skills (Grades 1-4) as needed.	*Test Trainer Pro* automatically adapts to student ability level as students move through questions. Instruct students to work in a higher grade level or Algebra I as needed.
The Math Simulator Immersion	Access Closed Caption and Spanish Subtitles within the video. Reinforce vocabulary in action: • *"Flash in the pan"*: a person who has sudden but brief success. • *Batting average*: a ratio of a batter's safe hits per time at bat. • *Prediction*: a thing that will happen in the future. • *Home plate*: the place on a baseball field a runner must touch after touching all other bases to score a run. • *Pennant*: the championship in baseball. • *Angle*: a way of telling a story. • *Stats*: a fact or piece of data. • *On base*: to hit the ball or otherwise get to advance from being up to bat to the base path in baseball. • *Runs*: a point scored by hitting a baseball and touching each of the bases and home plate. • *Up to bat*: getting a chance to hit the ball in order to advance to the base path.	
The Math Simulator Data & Computation	Use a 10×10 grid to create models to help students see the concept of percent concretely. Create a table, tape diagram, or double number line to help students visualize the data they are using in the problem.	Have students access the CIA Factbook online. Have each student pick a country and, using the statistics they find, make predictions about various factors of the country.
The Math Simulator Resolution	Access Closed Caption and Spanish Subtitles within the video.	Students can present their graphs to the class.

Component	Accommodations/Modifications	Extensions
The Math Simulator Resolution (cont'd)	Reinforce vocabulary in action: •*Equivalent*: equal in value or amount. •*Scoop*: a piece of news published by a newspaper in advance of its rivals. •*Stealing home*: running and touching home plate without being tagged out.	
Simulation Trainer	Pair students to allow for peer teaching and support. Create a table, tape diagram, or double number line to help students visualize the data they are using in the problem.	Have more proficient students on this skill coach less successful students. Have students continue to work on their country research and computations.
Practice Printable	Upon completion of the first page (Procedure #1), consider following the *Exit Ticket Differentiation Plan*. For the second page, #3 and #5, help students come up with their own table, tape diagram, double number line, or equation for each problem.	Upon completion of the first page (Procedure #1), consider following the *Exit Ticket Differentiation Plan*. Have students write a news article with their country predictions like the one from the *Immersion* and *Resolution* videos.
Clicker Quiz	Have more proficient students on this skill coach less successful students.	Have more proficient students on this skill coach less successful students. Task students with writing and solving their own "clicker quiz" question.
Student Reflection	Pair students to allow for peer teaching and support. Consider allowing EL students to write the narrative in their native language, then use a digital translator to help them transcribe it into English.	Have more proficient students on this skill coach less successful students.

Applying Mathematical Language Routines (MLRs)

While MLRs apply to all students, they are particularly beneficial for EL and other special populations. A full description of the MLRs is available in the Teacher Guide with a rationale for their use.

MLR 6

Three Reads

During *Data & Computation*, students have the task of predicting the number of times Jackie Robinson will get on base during the season.

Suggestion: Prior to the pencil-paper work, guide students through a Three Reads routine. During the first read, ask students to analyze the *Data Artifact* and discuss what they understand about the situation, leaving out numerical thoughts. On the second read, students analyze the *Data Artifact* and point out anything mathematical that they see or recognize. On the third read, ask students to brainstorm possible mathematical solution methods.

Instruction at a Glance

Gladys Graham

Kevin Simpson

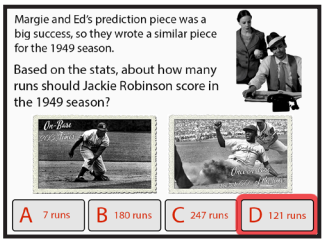
Megan LeBleu

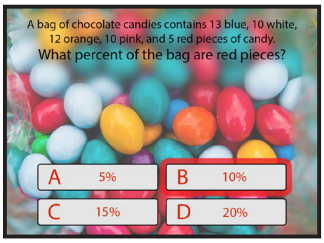
Gladys: This is your 6th graders' introduction to percents. Help them connect their prior understanding of fractions and decimals to percents.

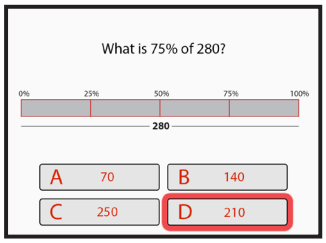
Kevin: Help students understand that "*n* percent" is a rate per 100 (*n*/100), and that this rate may be used in ratio tables, double number lines, or with fraction and decimal operations.

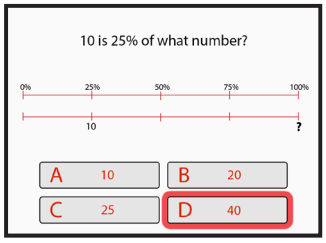
Megan: Use a 10 × 10 grid to create models to help students see the concept of percent concretely. Use the model to connect different representations (percents, decimals, and fractions).

Clicker Quiz









Practice Printable

Full-sized Answer Key available in printed Teacher's Guide

Name _____ Date _____ Period _____

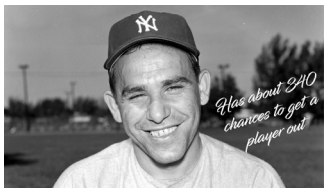
STEALING HOME

How many outs will Yogi Berra get in the 1948 season?

The *Chicago Daily News* prediction piece on Jackie Robinson was so popular that Margie and Ed decide to write a piece on another popular baseball player, Yogi Berra. Berra is only a few years into his major league baseball career, playing catcher for the New York Yankees. After doing some research, Margie and Ed found some information that would help them write their article.

Given the stats Margie and Ed obtained, how many outs will Yogi Berra likely get in the 1948 season?

6.RP.A.3c
About this standard
Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.



Strategies may vary.

Yogi Berra will likely get 289 outs in the 1948 season.

Name _____ Date _____ Period _____

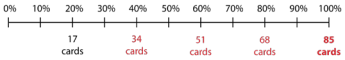
APPLYING THE STANDARD

How might this standard appear on a test?

CHECK OUT MY WORKED EXAMPLE #5B

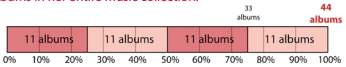
1) Joey brought 17 baseball trading cards to school. This represents only 20% of his collection. How many trading cards does he have in his whole collection?

Joey has 85 cards in his whole collection.



2) Country music makes up 75% of Ashley's music collection. If she has 33 albums that are by country artists, how many albums does she have in her entire music collection?

Ashley has 44 albums in her entire music collection.



3) Tyrell took a history test. He answered 21 of the 25 questions correctly. In order to get an "A" on the test he needs to get at least a 90%. Did Tyrell get an "A" on his history test? Explain your reasoning.

Tyrell did not get an "A" on his history test. 21 out of 25 questions correct is an 84%.

4) Cade makes 82% of his free throw attempts. If, at a basketball camp, he attempts 250 free throws, how many can he expect to get in?

Number of times the ball goes in the net	82	164	41	205
Number of attempts	100	200	50	250

205 of Cade's 250 free throw attempts will likely go in the net.

5) Solve each problem below by using a table of equivalent ratios, a tape diagram, a double number line or an equation. Pay attention to whether the part or the whole is unknown.

a) 75 is 15% of what number?

500

b) What is 60% of 210?

Answer representations will vary.

126

c) 120 is 30% of what number?

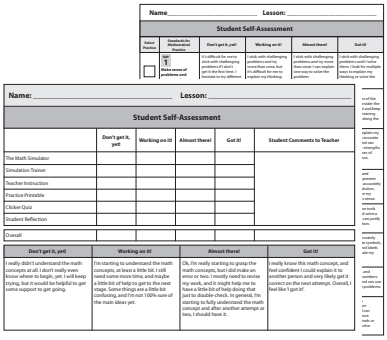
400

d) 160 is 20% of what number?

800

Student Self-Assessment

Student Self-Assessments are an excellent way for teachers to gauge student learning. In combination with qualitative and quantitative data from the assignments, teachers can form a clear picture of student needs and follow-up appropriately. These self-assessments, if completed by students throughout a lesson, not only provide the teacher with useful information, but also improve student self-monitoring of learning.



Materials

- *Student Self-Assessment*
- Pencil

Standards Assessed:

- 6.RP.A.3c
- SMP 2 (*Data & Computation, Practice Printable, Clicker Quiz*)
- SMP 5 (*Data & Computation, Practice Printable*)

Recommendations for Use:

Mathematical Standard

1. Distribute the *Student Self-Assessment* at the beginning of the lesson and fill in Name and Lesson title.
2. After each lesson component (*The Math Simulator, Simulation Trainer, Teacher Instruction, Practice Printable, Clicker Quiz, Student Reflection, Overall*), give students the opportunity to reflect on their perceived proficiency and knowledge of the content.
3. Ask students to mark their perceived proficiency or knowledge of the content, according to the scale provided (*Don't get it, yet!, Working on it!, Almost there!, Got it!*).
4. Students may then write any additional comments about their learning in the space provided.

Standards for Mathematical Practice

1. After students have completed a component that utilizes a specified SMP (as indicated above), have students mark the column on the SMP side of the *Student Self-Assessment*, to indicate the Standards for Mathematical Practice emphasized in that component.
2. Ask students to read through the various descriptions for that particular SMP and then mark the description that best describes their degree of use of the practice.
3. Repeat for other SMPs used in other lesson components.

Recommendations for Follow-Up:

Don't get it, yet!

Students in this learning phase require personal tutoring.

Partner with a classmate who rated themselves in the **Got it!** category. Review with your partner:

6.RP.A.3c Stealing Home
Math Simulator

- Watch the *Immersion* video, and explain the story and the question.
- Review the class WorkPads, and discuss strategies used to solve the problem.
- Watch the *Resolution* video, and revise your work.

Working on it!

Students in this learning phase need focus in conceptual work.

Create a personal visual glossary for lesson vocabulary.

6.RP.A.3c Vocabulary Words:
Part
Whole
Percent

- Look up each word in the student glossary.
- Read the definition and think about its meaning.
- Draw a picture that illustrates the meaning.

Almost there!

Students in this learning phase need practice with procedures.

Review the *Worked Example* video in the *Practice Printable* assignment and the written *Example Problem* in the *Student Workbook*:

6.RP.A.3c Stealing Home
Worked Example

Compare your thinking to the video and the written solution.

- Identify any places where you have made mistakes.
- Correct any mistakes you have made on the *Practice Printable*.

Got it!

Students in this learning phase can reinforce their learning by teaching others.

Partner with a classmate who rated themselves in the **Don't get it yet!** category. Review with your partner:

6.RP.A.3c Stealing Home
Math Simulator

- Watch the *Immersion* video, and ask them to explain the story and the question.
- Review the class WorkPads, and discuss strategies used to solve the problem.
- Watch the *Resolution* video, and have your partner revise their work.

Test Trainer Pro

Allow 7 to 10 minutes

As a warm-up, tell students to log into their account and access *Test Trainer Pro*. Specify the domain in which you would like students to work (preferably a different one than the prior day) and also the length of time you wish students to work (not a number of items). It is important to remind students to work out the math using paper and pencil when necessary and to look at their feedback.

The Math Simulator™

Allow 45 minutes

1 Immersion

Materials

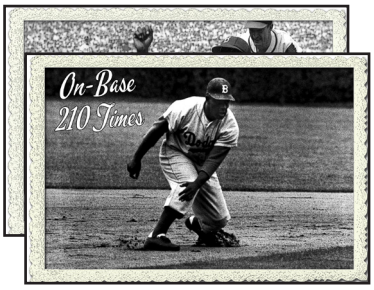
- *Stealing Home Immersion* video
- Chart paper/Interactive whiteboard

Procedure

1. Play the *Immersion* video to the whole class.
2. Restate the question and keep it visible: *How many runs will Jackie Robinson likely score in the 1948 season?*
3. Use the **Think-Pair-Share** protocol. Ask students: *What do we need to know?*

Think-Pair-Share
Ask students to think individually about what information they need to know and make some notes (≈ 1-2 min). Tell students to pair with a partner and discuss their notes (≈ 2 min). Finally, facilitate whole-class by cold-calling on students to share their strategies on an interactive board (≈ 2 min).

2 Data & Computation



Materials

- Copies of *Stealing Home Data Artifact*, one per student

Procedure

1. Distribute the *Data Artifact* to each student.
2. Invite students to work individually or with a partner to arrive at a solution.
3. Observe students at work. As students explain their reasoning to you and to classmates, look for opportunities to clarify their vocabulary. Allow students to 'get their idea out' using their own language but when possible, make clarifying statements using precise vocabulary to say the same thing. This allows students to hear the vocabulary in context, which is among the strongest methods for learning vocabulary. Also ask students clarifying questions to further their thinking.
    - *What information are we given? The whole, part, and/or percent?*
    - *What information is missing? The whole, part, and/or percent?*
    - *How can you estimate the number of runs Jackie Robinson will score?*
    - *How can the problem be represented visually?*
    - *What strategies do you know that can help you calculate 52% of 210?*

4. After determining students are nearing 'sufficient' progress, either consider using an additional teaching protocol, or ask students to provide a thumbs up/middle/down to indicate readiness to see the *Resolution* video. You may grant students additional work time, if necessary.

3 Resolution

Materials

- *Stealing Home Resolution* video

Procedure

1. Play *Resolution* video to the whole class, and have the students compare their solutions as they watch.
2. After the video, prompt students with the following questions:
    - *What did you do that was the same?*
    - *What was different?*
    - *What method did you find most efficient? Why?*

   Students may respond aloud or in a journal.

Answer:
Jackie Robinson will score about 109 runs in the 1948 season.

Student Self-Assessment

- Refer to the instructions for the *Studenf Self-Assessment* (on a prior page of this lesson plan).
- Allow students time to assess their level of knowledge after having completed this component.
- Collect the self-assessment from students, or have them keep it for later components.

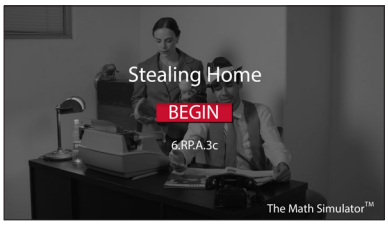
Test Trainer Pro

Allow 7 to 10 minutes

As a warm-up, tell students to log into their account and access *Test Trainer Pro*. Specify the domain in which you would like students to work (preferably a different one than the prior day) and also the length of time you wish students to work (not a number of items). It is important to remind students to work out the math using paper and pencil when necessary and to look at their feedback.

The Math Simulator™
Simulation Trainer

Allow 25 to 35 minutes



Materials

- *Stealing Home Simulation Trainer*
- Student Devices
- Paper and Pencil
- Student Headphones

Procedure

1. Assign the *Simulation Trainer* to all students.
2. Tell students to navigate to the *Simulation Trainer* assignment.
3. Have students work individually to start.
4. Consider using varied protocols that include peer teaching.
5. Use *Progress Monitoring* on the *Teacher Dashboard* to determine which students are having difficulty. Provide individual help when necessary.

Student Self-Assessment

- Refer to the instructions for the *Studenf Self-Assessment* (on a prior page of this lesson plan).
- Allow students time to assess their level of knowledge after having completed this component.
- Collect the self-assessment from students, or have them keep it for later components.

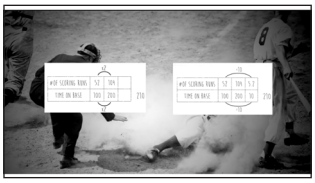
Teacher Instruction

Allow 10 to 15 minutes

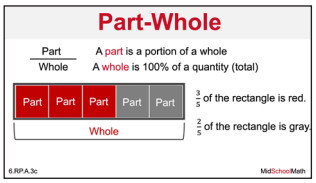
Consider this sample lecture to accompany the slide deck in the *Teacher Instruction* component. You may deliver the slide deck yourself, watch the video as a class, or assign the video to student devices. Alternatively, you may create and deliver your own concise, brief lecture using any method you see fit.

We're going to take a deeper look at the math we used in *Stealing Home*.

In *Stealing Home*, Margie and Ed want to write a newspaper story predicting how many runs baseball player Jackie Robinson will have in the 1948 season.



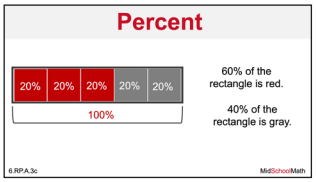
Margie and Ed know that Jackie scores 52% of the time when he gets on base. They set up a ratio table using 52 runs out of 100 times on base as a starting point since a percent is a number out of 100.
Margie and Ed predict that Jackie Robinson will get on base 210 times, so they use a ratio table and equivalent rates to figure out how many of those times on base will end with Jackie scoring.
Margie verifies their solution by multiplying 210 times fifty-two hundredths because that is 52% in decimal form. They round 109.2 to 109 runs.



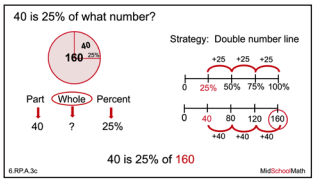
Let's review parts and wholes. A part is a portion of a whole, and a whole is 100%, or all, of something.
Looking at the rectangle, what can we see?

- There are 5 parts that make up the whole rectangle.
- There are 3 red parts in the rectangle.
- There are 2 gray parts in the rectangle.

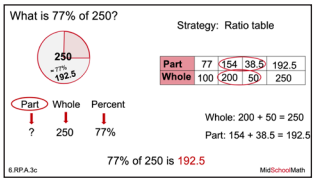
We can say that 3 parts out of 5 total are red, or three-fifths of the rectangle is red.
2 parts out of 5 total are gray, so two-fifths of the rectangle is gray.



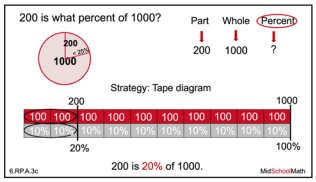
A percent is a part-whole relationship where the whole is 100%.
So, the whole rectangle is 100%. Since there are five equal parts, that 100% can be divided equally into 5 parts, which means each part is 20%.
Now we can see that 60% of the rectangle is red and 40% of the rectangle is gray.
When working with percentages, it's important to be able to identify the whole and the part.



Let's use the part-whole relationship to solve this problem. 40 is 25% of what number?
We need to identify the information we have and the information that is missing. A visual might help us understand. If we have a circle, we know that 25% (or one-quarter of it) has a value of 40. What we don't know is the value of the entire circle. This can help us identify that 40 is the part, 25 is the percent, and the whole is the unknown.
One strategy we can use is a double number line, each with equally spaced segments. The first number line will represent the percent, using intervals of 25 as the scale to 100. The second number line will represent the parts and whole, using intervals of 40 as the scale, since that is the known part. Add 40 to each segment, up to the segment that aligns to 100%. 160 is the value that aligns to 100%, so the whole is 160. So, 40 is 25% of 160.



Let's use the part-whole relationship again to solve this problem. What is 77% of 250?
Again, a visual could be helpful. If we have a circle, the problem tells us we're looking for a piece or part of 250, so 250 is the value of the whole circle. We want to know the value of 77% of that whole, which is slightly more than three-quarters of the circle. That is our unknown part. So now we see that 250 is the whole, 77 is the percent, and the part is unknown.
A double number line like we used before might not work as well here because there's not an efficient way to create a scale from 77% to 100%. Another strategy we can use is a ratio table, like the one in *Stealing Home*. We know 77% is a ratio that means 77 out of 100, where 77 is the part and 100 is the whole. We set up our table using this ratio, looking at parts and wholes that are equivalent to 77 out of 100.
Our goal is to get to a ratio that shows us the part when the whole is 250. So, we might start by multiplying the original ratio by 2. This gives us a whole of 200 and a part of 154. It will help us to get 50 as a whole, so let's divide the original ratio by 2. Now we have a whole of 50 and a part of 38.5. Because we have a ratio table, we can combine ratios that are helpful to us. If we add the whole values of 200 and 50, we'll have a whole of 250. But that means we also add the part values for those ratios, so we add 154 and 38.5, which gives us a part of 192.5. So, 77% of 250 is 192.5.



200 is what percent of 1000?

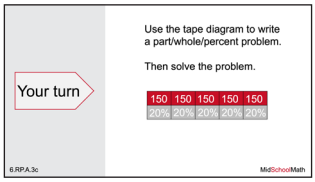
When we read this, we see that the percent is the unknown, so now we need to decide which number is the part and which is the whole. We're basically being asked '200 is what part of 1000?' so 200 is the part and 1000 is the whole. Let's again draw a circle to help us visualize the problem. The value of the whole circle is 1000 and the part is 200…but what percent is it? We can estimate using our circle. 50% (or half) of 1000 is 500. 200 is less than 50%. If we cut that in half again, we find that 25% of 1000 is 250. We're getting closer but 200 is still less than that by a little bit. So, we can estimate that 200 is less than 25% of 1000.

An additional strategy we can use to get a more precise solution is a tape diagram, which is similar to a double number line. One row represents the parts and the whole, and the other row represents the percent.

We'll use the tape diagram to help us break up the whole of 1000 into equal parts. Increments of 100 are helpful because our part (200) is a multiple of 100. The entire first row now represents the whole of 1000, which means the entire bottom row represents 100%. This row is also divided into the same number of segments as the whole, making each section 10%.

Now we can identify the parts of the top tape that make 200. Then we look at the corresponding percents on the bottom tape. We see that 200 corresponds to 20% in this diagram.

This tells us that 200 is 20% of 1000, which matches our estimate of being less than 25%.



Now it's your turn.

Note: Feel free to modify this part to suit your needs. You may even want to change this entirely to another activity or question.

Student Self-Assessment

- Refer to the instructions for the *Studenf Self-Assessment* (on a prior page of this lesson plan).
- Allow students time to assess their level of knowledge after having completed this component.
- Collect the self-assessment from students, or have them keep it for later components.

Test Trainer Pro

Allow 7 to 10 minutes

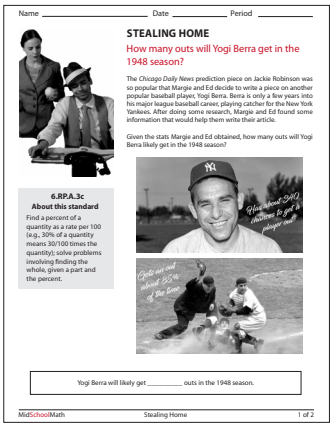
As a warm-up, tell students to log into their account and access *Test Trainer Pro*. Specify the domain in which you would like students to work (preferably a different one than the prior day) and also the length of time you wish students to work (not a number of items). It is important to remind students to work out the math using paper and pencil when necessary and to look at their feedback.

Practice Printable

Allow 35 minutes

Materials

- Copies of *Stealing Home Practice Printable*, 1 per student


Name _____ Date _____ Period _____

STEALING HOME

How many outs will Yogi Berra get in the 1948 season?

The *Chicago Daily News* prediction piece on Jackie Robinson was so popular that Margie and Ed decide to write a piece on another popular baseball player, Yogi Berra. Berra is only a few years into his major league baseball career, playing catcher for the New York Yankees. After doing some research, Margie and Ed found some information that would help them write their article.

Given the stats Margie and Ed obtained, how many outs will Yogi Berra likely get in the 1948 season?

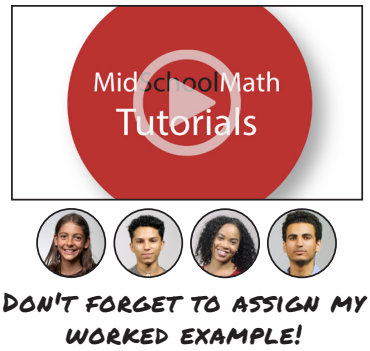
6.RP.A.3c
About this standard
Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

Yogi Berra will likely get _____ outs in the 1948 season.

MidSchoolMath Stealing Home 1 of 2

Procedure

1. Distribute copies of the *Practice Printable*. Have students work through the first page.
2. Self-Rating: Ask students to rate their personal understanding of the problem on a scale of 1 to 3.
   1 = I need more help
   2 = I need more time, yet mostly understand
   3 = I've got this!
   Have students put the number on their *Practice Printable*.
3. Have students sort themselves based on the student self-rating and professional teacher judgment of accuracy of the response. This sorting can be used for grouping students for differentiation of instruction.
4. Implement the **Practice Printable Differentiation Plan** (see below) as students finish the *Practice Printable*.
5. Collect completed *Practice Printable*.



DON'T FORGET TO ASSIGN MY WORKED EXAMPLE!

Student Self-Assessment

- Refer to the instructions for the *Studenf Self-Assessment* (on a prior page of this lesson plan).
- Allow students time to assess their level of knowledge after having completed this component.
- Collect the self-assessment from students, or have them keep it for later components.

Practice Printable Differentiation Plan

Remediation

Meet with students who were unsuccessful on the first problem in a small group. Consider using whiteboards to work through problems on the *Practice Printable* together.

Practice

Students who completed the first problem but need more practice should spend the class period completing the *Practice Printable*. Encourage them to confirm strategies and solutions with each other. Any additional time remaining should be spent getting started on the *Student Reflection*.

Enrichment

Students who demonstrated confident mastery on the first problem can finish the *Practice Printable* and spend the remaining time getting started on the *Student Reflection* or completing the following activity:

- Research basketball (or any sport) and find related statistics.
- Examples include shots made and shots attempted, free throw shots made and free throw shots attempted, three-point shots made and three-point shots attempted, offensive rebounds and total rebounds
- Make up various questions involving a missing percent, a missing whole and also a missing part.
- Trade with another student.

Student Reflection

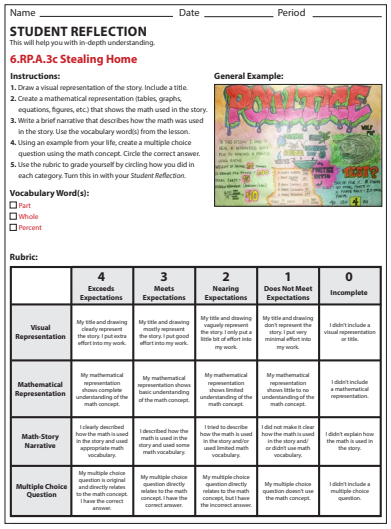
Allow 10 minutes (optional)

Materials

- Copies of *Student Reflection* rubric, 1 per student
- White Paper
- Colored Pencils

Procedure

1. Available in the *Student Reflection* lesson on Teacher Dashboard, print and distribute the rubric. Discuss requirements with students.
2. Distribute white paper and colored pencils to students.
3. Have students begin the *Student Reflection* by sketching a draft. They will have additional time the following day to complete it.



Name _____ Date _____ Period _____

STUDENT REFLECTION

This will help you with in-depth understanding.

6.RP.A.3c Stealing Home

Instructions:

1. Draw a visual representation of the story. Include a title.
2. Create a mathematical representation (tables, graphs, equations, figures, etc.) that shows the math used in the story.
3. Write a brief narrative that describes how the math was used in the story. Use the vocabulary word(s) from the lesson.
4. Using an example from your life, create a multiple choice question using the math concept. Circle the correct answer.
5. Use the rubric to grade yourself by circling how you did in each category. Turn this in with your *Student Reflection*.

General Example:

Vocabulary Word(s):

☐ Part
☐ Whole
☐ Percent

Rubric:

	4 Exceeds Expectations	3 Meets Expectations	2 Nearing Expectations	1 Does Not Meet Expectations	0 Incomplete
Visual Representation	My title and drawing clearly represent the story. I put extra effort into my work.	My title and drawing mostly represent the story. I put good effort into my work.	My title and drawing vaguely represent the story. I only put a little bit of effort into my work.	My title and drawing don't represent the story. I put very minimal effort into my work.	I didn't include a visual representation or title.
Mathematical Representation	My mathematical representation shows complete understanding of the math concept.	My mathematical representation shows basic understanding of the math concept.	My mathematical representation shows limited understanding of the math concept.	My mathematical representation shows little to no understanding of the math concept.	I didn't include a mathematical representation.
Math-Story Narrative	I clearly described how the math is used in the story and used appropriate math vocabulary.	I described how the math is used in the story and used some math vocabulary.	I tried to describe how the math is used in the story and/or used limited math vocabulary.	I did not make it clear how the math is used in the story and/ or didn't use math vocabulary.	I didn't explain how the math is used in the story.
Multiple Choice Question	My multiple choice question is original and directly relates to the math concept. I have the correct answer.	My multiple choice question directly relates to the math concept. I have the correct answer.	My multiple choice question directly relates to the math concept, but I have the incorrect answer.	My multiple choice question doesn't use the math concept.	I didn't include a multiple choice question.

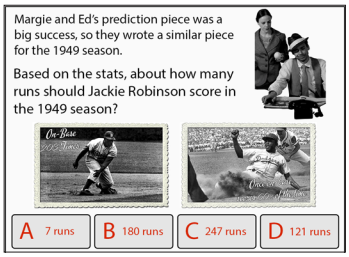
Test Trainer Pro

Allow 7 to 10 minutes

As a warm-up, tell students to log into their account and access *Test Trainer Pro*. Specify the domain in which you would like students to work (preferably a different one than the prior day) and also the length of time you wish students to work (not a number of items). It is important to remind students to work out the math using paper and pencil when necessary and to look at their feedback.

Clicker Quiz

Allow 30 minutes



Materials

- *Stealing Home Clicker Quiz*
- Student Devices
- Paper and Pencil

Procedure

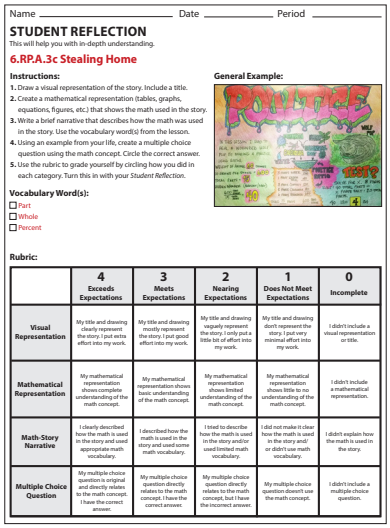
1. Ask students to log into their account and access *Virtual Clicker*.
2. Open the *Clicker Quiz*, whole class.
3. Prompt students to enter the quiz code on their device.
4. Launch quiz.
5. For each question:
    a. Show question and give students time to work. Consider using various protocols (i.e., students work individually, work with a partner, or maybe they have to agree with an entire table).
    b. Click "Vote," and students will have 10 seconds to enter a response.
    c. Analyze class distribution. Decide whether more teaching is necessary, either a mini-lesson from you or by having students share strategies.
    d. Click ">" to advance to the next question.
    e. You may either then "Skip" the question or repeat steps a through e.

Student Self-Assessment

- Refer to the instructions for the *Studenf Self-Assessment* (on a prior page of this lesson plan).
- Allow students time to assess their level of knowledge after having completed this component.
- Collect the self-assessment from students, or have them keep it for later components.

Student Reflection

Allow 20 minutes (optional)



Name _____ Date _____ Period _____

STUDENT REFLECTION

This will help you with in-depth understanding.

6.RP.A.3c Stealing Home

Instructions:

1. Draw a visual representation of the story. Include a title.
2. Create a mathematical representation (tables, graphs, equations, figures, etc.) that shows the math used in the story.
3. Write a brief narrative that describes how the math was used in the story. Use the vocabulary word(s) from the lesson.
4. Using an example from your life, create a multiple choice question using the math concept. Circle the correct answer.
5. Use the rubric to grade yourself by circling how you did in each category. Turn this in with your *Student Reflection*.

General Example:

Vocabulary Word(s):

☐ Part
☐ Whole
☐ Percent

Rubric:

	4 Exceeds Expectations	3 Meets Expectations	2 Nearing Expectations	1 Does Not Meet Expectations	0 Incomplete
Visual Representation	My title and drawing clearly represent the story. I put extra effort into my work.	My title and drawing mostly represents the story. I put good effort into my work.	My title and drawing vaguely represent the story. I only put a little bit of effort into my work.	My title and drawing don't represent the story. I put very minimal effort into my work.	I didn't include a visual representation or title.
Mathematical Representation	My mathematical representation shows complete understanding of the math concept.	My mathematical representation shows basic understanding of the math concept.	My mathematical representation shows limited understanding of the math concept.	My mathematical representation shows little to no understanding of the math concept.	I didn't include a mathematical representation.
Math Story Narrative	I clearly described how the math is used in the story and used appropriate math vocabulary.	I described how the math is used in the story and used some math vocabulary.	I tried to describe how the math is used in the story and/or used limited math vocabulary.	I did not make it clear how the math is used in the story and/or didn't use math vocabulary.	I didn't explain how the math is used in the story.
Multiple Choice Question	My multiple choice question is original and directly relates to the math concept. I have the correct answer.	My multiple choice question directly relates to the math concept. I have the correct answer.	My multiple choice question directly relates to the math concept, but I have the incorrect answer.	My multiple choice question doesn't use the math concept.	I didn't include a multiple choice question.

Materials

- *Student Reflections* from Day 3
- White Paper
- Colored Pencils
- Sticky Notes

Procedure

1. Students continue working and complete their *Student Reflections*.
2. Consider having a **Gallery Walk** when they are complete, using the **I Wonder…, I Notice…** protocol and sticky notes.

Gallery Walk (16-20 min)

Display student work (such as Student Reflections) on classroom walls. Assign groups with tasks focused on specific details (such as identifying different ways to solve a problem) and/or larger patterns (such as general misconceptions). Tell groups to walk around, complete their task (≈ 8-10 min), then prepare and report brief remarks to the class with their broader "a-ha" and "why" understandings (≈ 8-10 min).

I Wonder . . . , I Notice . . . (8-10 min)

Following a completed whole-class assignment, set ground rules for peer critique, including being thoughtful, specific, helpful and joining in (≈ 1 min)! Choose a student to be "the originator" who is tasked to explain his or her approach and solution to a problem (≈ 2 min), while other students listen only. Then ask other students to ask "the originator" clarifying questions or comments that start with 'I wonder' and 'I notice' (≈ 5-6 min).

Student Self-Assessment

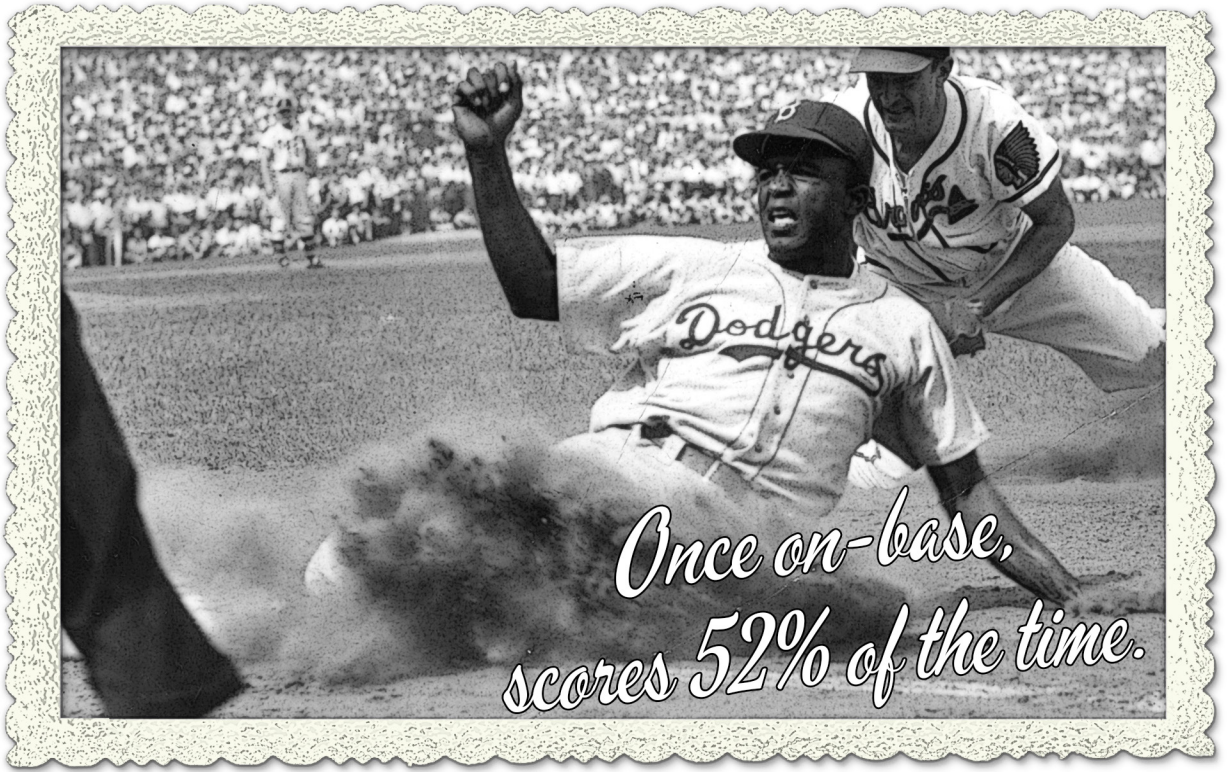
- Refer to the instructions for the *Studenf Self-Assessment* (on a prior page of this lesson plan).
- Allow students time to assess their level of knowledge after having completed this component.
- Collect the self-assessment from students, or have them keep it for later components.

STEALING HOME

Artifact 1

STEALING HOME

Artifact 2



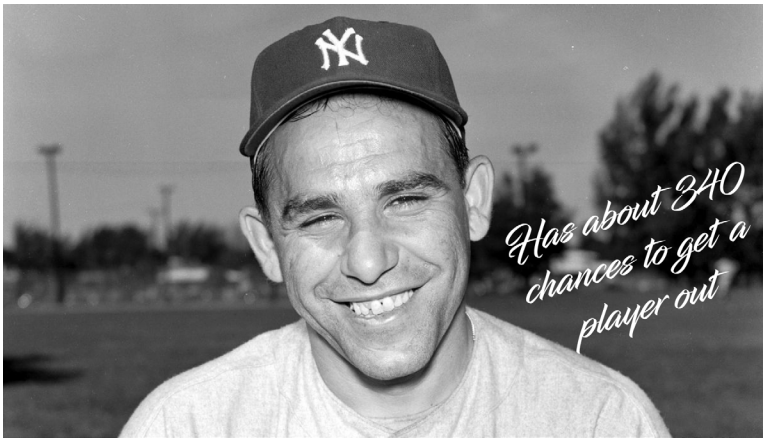
Name _____ Date _____ Period _____

STEALING HOME

How many outs will Yogi Berra get in the 1948 season?

The *Chicago Daily News* prediction piece on Jackie Robinson was so popular that Margie and Ed decide to write a piece on another popular baseball player, Yogi Berra. Berra is only a few years into his major league baseball career, playing catcher for the New York Yankees. After doing some research, Margie and Ed found some information that would help them write their article.

Given the stats Margie and Ed obtained, how many outs will Yogi Berra likely get in the 1948 season?



6.RP.A.3c

About this standard

Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

Yogi Berra will likely get _____ outs in the 1948 season.

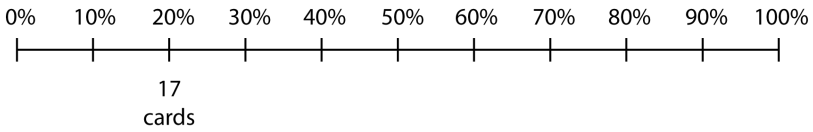
Name _____ Date _____ Period _____

APPLYING THE STANDARD

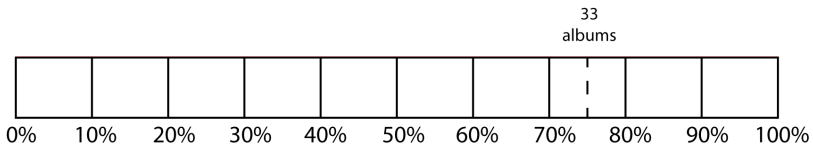
How might this standard appear on a test?

CHECK OUT MY WORKED EXAMPLE #5B

1) Joey brought 17 baseball trading cards to school. This represents only 20% of his collection. How many trading cards does he have in his whole collection?



2) Country music makes up 75% of Ashley's music collection. If she has 33 albums that are by country artists, how many albums does she have in her entire music collection?



3) Tyrell took a history test. He answered 21 of the 25 questions correctly. In order to get an "A" on the test he needs to get at least a 90%. Did Tyrell get an "A" on his history test? Explain your reasoning.

4) Cade makes 82% of his free throw attempts. If, at a basketball camp, he attempts 250 free throws, how many can he expect to get in?

Number of times the ball goes in the net	82			
Number of attempts	100	200	50	250

5) Solve each problem below by using a table of equivalent ratios, a tape diagram, a double number line or an equation. Pay attention to whether the part or the whole is unknown.

a) 75 is 15% of what number?

b) What is 60% of 210?

c) 120 is 30% of what number?

d) 160 is 20% of what number?

Name: _____ **Lesson:** _____

Student Self-Assessment

	Don't get it, yet!	Working on it!	Almost there!	Got it!	Student Comments to Teacher
The Math Simulator					
Simulation Trainer					
Teacher Instruction					
Practice Printable					
Clicker Quiz					
Student Reflection					

Overall					

Don't get it, yet!	Working on it!	Almost there!	Got it!
I really didn't understand the math concepts at all. I don't really even know where to begin, yet. I will keep trying, but it would be helpful to get some support to get going.	I'm starting to understand the math concepts, at least a little bit. I still need some more time, and maybe a little bit of help to get to the next stage. Some things are a little bit confusing, and I'm not 100% sure of the main ideas yet.	Ok, I'm really starting to grasp the math concepts, but I did make an error or two. I mostly need to revise my work, and it might help me to have a little bit of help doing that just to double-check. In general, I'm starting to fully understand the math concept and after another attempt or two, I should have it.	I really know this math concept, and feel confident I could explain it to another person and very likely get it correct on the next attempt. Overall, I feel like 'I got it!'.

Name_____ **Lesson:** _____

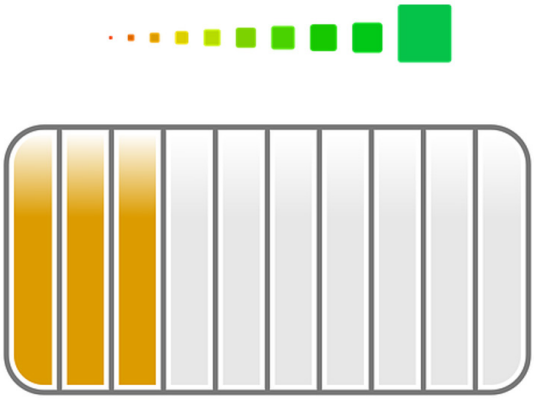
Student Self-Assessment

Select Practice	Standards for Mathematical Practice	Don't get it, yet!	Working on it!	Almost there!	Got it!
☐	SMP 1 **Make sense of problems and persevere in solving them.**	It's difficult for me to stick with challenging problems if I don't get it the first time. I hesitate to try different strategies.	I stick with challenging problems and try more than once, but it's difficult for me to explain my thinking.	I stick with challenging problems and try more than once. I can explain one way to solve the problem.	I stick with challenging problems until I solve them. I look for multiple ways to explain my thinking or solve the problem.
☐	SMP 2 **Reason abstractly and quantitatively.**	It's difficult for me to create a representation of the problem. I don't know how to apply math symbols to solve problems.	I can create a representation of the problem, but I often lose track of the units or the meaning of my results along the way.	I can create a representation of the problem, but I sometimes lose track of the units or the meaning of my results along the way.	I can create a representation of the problem. I consider the units involved and keep track of the meaning of my results along the way.
☐	SMP 3 **Construct viable arguments and critique the reasoning of others.**	It's difficult for me to explain my own thinking and to understand the thinking of others.	I sometimes explain my own thinking but without accurate vocabulary, and rarely understand the solutions of others.	I often explain my thinking with accurate vocabulary, and can sometimes identify strengths and weaknesses of others' solutions.	I frequently explain my thinking with accurate vocabulary, and can often identify strengths and weaknesses of others' solutions.
☐	SMP 4 **Model with mathematics.**	It's difficult for me to represent problems and to develop a structure to solve them.	I identify important quantities in problems but have difficulty representing their relationships.	I use models and symbols to represent problem, and can explain the solution.	I use models and symbols to represent problem, can accurately explain the solution, and make sure my answer makes sense.
☐	SMP 5 **Use appropriate tools strategically.**	It's difficult for me to know when and how to use tools to help me solve a problem.	I sometimes use tools to explore and solve a problem but it's difficult to justify my choice.	I often use tools to explore and solve a problem and can justify my tool selection.	I frequently use tools to explore and solve a problem and can justify my tool selection.
☐	SMP 6 **Attend to precision.**	My calculations are often inaccurate, and it's difficult for me to communicate my thinking.	My calculations are sometimes inaccurate, and my communication is not always clear.	I calculate accurately and mostly use symbols, vocabulary, and labels to communicate my thinking.	I calculate accurately and always use symbols, vocabulary, and labels to communicate my thinking.
☐	SMP 7 **Look for and make use of structure.**	It's difficult for me to see patterns and structures in numbers and figures.	I sometimes see patterns and structures in numbers and figures, and can sometimes use them to solve problems.	I often see patterns and structures in numbers and figures, and can often use them to solve problems.	I see patterns and structures in numbers and figures, and can use them to solve problems.
☐	SMP 8 **Look for and express regularity in repeated reasoning.**	It's difficult for me to notice repeated calculations, and rarely find shortcuts.	I sometimes notice when calculations are repeated and might be able to find shortcuts to solve problems.	I notice when calculations are repeated and can often find shortcuts to solve problems.	I notice when calculations are repeated and can always find more efficient methods or shortcuts to solve problems.

Name _____ Date _____ Period _____

6.RP.A.3c ADDITIONAL PRACTICE

1) What percent battery is left on this phone?

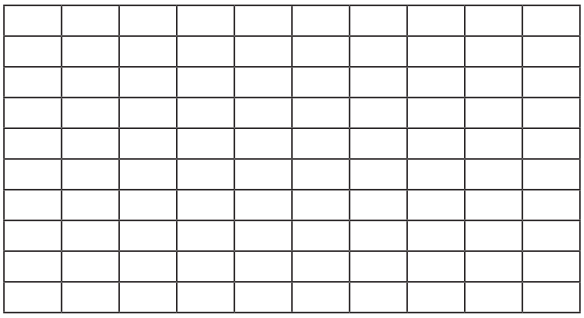


2) There were 100 people at the party. If 33 of the people wore hats,

a) What percent of the people had hats at the party?

b) What percentage of the people did not have hats?

3) If 24% of the population is under the age of 18, show this percentage on the grid provided.



4) 35% of the people who voted chose "yes" on the ballot. If 1500 people voted, how many people voted "yes"?

5) 75% of the dogs had their leashes on at the park. If there were 24 dogs at the park,

a) How many had their leashes on?

b) How many were off-leash?

6) Jerome had a 20% off coupon. He bought jeans with a price tag of $120.00.

How much money did he save with his coupon?

Name _____ Date _____ Period _____

6.RP.A.3c ADDITIONAL PRACTICE (cont'd)

7) Which discount is a larger amount? 25% off of $350.00 or 15% off $500.00?

8) 28 is 40% of what number?

9) 85% of _____ is 425

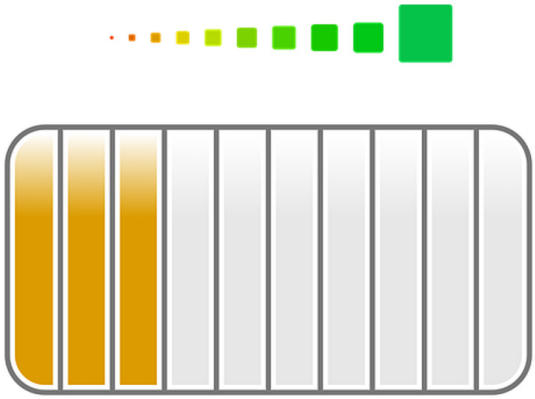
10) Marc's grandfather left an 18% tip on the bill. His tip was $36.00. What was the bill before tip?

Name _____ Date _____ Period _____

6.RP.A.3c ADDITIONAL PRACTICE

Answer Key

1) What percent battery is left on this phone?



30%

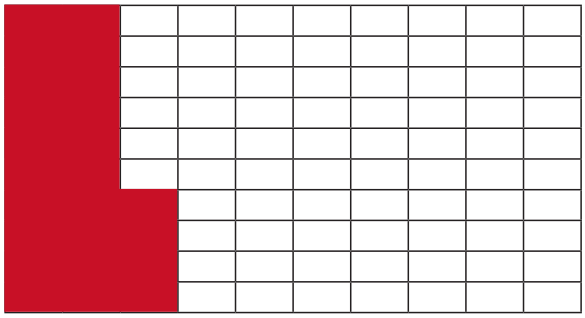
2) There were 100 people at the party. If 33 of the people wore hats,

a) What percent of the people had hats at the party?

b) What percentage of the people did not have hats?

a) 33%
b) 67%

3) If 24% of the population is under the age of 18, show this percentage on the grid provided.



4) 35% of the people who voted chose "yes" on the ballot. If 1500 people voted, how many people voted "yes"?

525 people voted yes

5) 75% of the dogs had their leashes on at the park. If there were 24 dogs at the park,

a) How many had their leashes on?

b) How many were off-leash?

a) 18
b) 6

6) Jerome had a 20% off coupon. He bought jeans with a price tag of $120.00.

How much money did he save with his coupon?

$24.00

Name _____ Date _____ Period _____

6.RP.A.3c ADDITIONAL PRACTICE (cont'd) Answer Key

7) Which discount is a larger amount? 25% off of $350.00 or 15% off $500.00?

25% off of $350.00 = $87.50

8) 28 is 40% of what number?

70

9) 85% of 500 is 425

10) Marc's grandfather left an 18% tip on the bill. His tip was $36.00. What was the bill before tip?

$200