Fielding Percentage

Growing Mathletes

Fielding Percentage Lesson Overview

Key Ideas in this Session:

Youth learn how to measure fielding percentage by catching baseball cards, and how to represent fielding percentage using fractions, decimals and percent. Youth also learn how to make SMART goals for new challenges.

Driving Questions:

1. What is fielding percentage in baseball? What are different ways to calculate and represent fielding percentage?
2. What are different ways to calculate and represent fielding percentage?

Math Standards:

4.NF.6 Use decimal notation for fractions with denominators 10 or 100.

6.RP.3c 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.

Activity	Time	Description
Activity 1	30 minutes (optional 10 minute activity)	Youth will use fractions, decimals and percent to represent the proportion of 10 trials that resulted in a specific outcome (a "catch"). This activity will be done with baseball cards. There is an optional activity for youth to practice fielding percentage with tennis balls.
Activity 2	20 minutes	Youth will watch a video and discuss how they can learn from mistakes. Youth set SMART goals related to new challenges.

Materials

- Baseball cards (a set of 10 cards for each pair of youth)
- Optional: Tennis balls (one per youth pair)
- Worksheet 1 (one copy per youth)
- Worksheet 2 (one copy per youth)

Set-Up

For the first part of **Activity 1**, group youth in pairs. Hand out 10 baseball cards to each pair. Distribute 1 copy of **Worksheet 1** to each youth. For the optional part of **Activity 1**, group youth in pairs. Hand out 1 tennis ball to each pair.

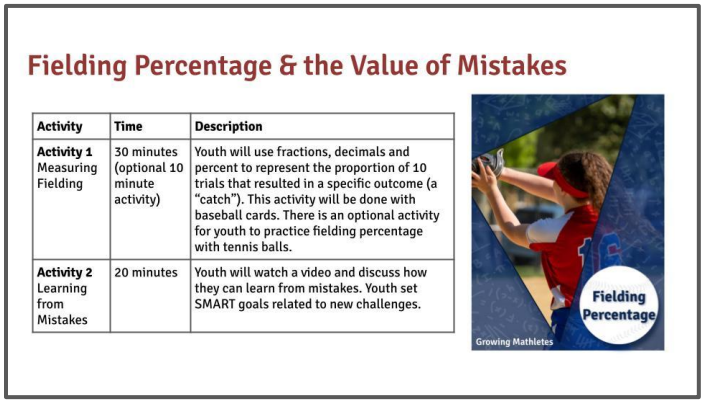
For Activity 2, show youth either video and facilitate a discussion. Distribute one copy of **Worksheet 2** to each youth.

Growth Mindset Connections

The value of mistakes in supporting learning.
The power of effort and persistence.

Fielding Percentage Introduction

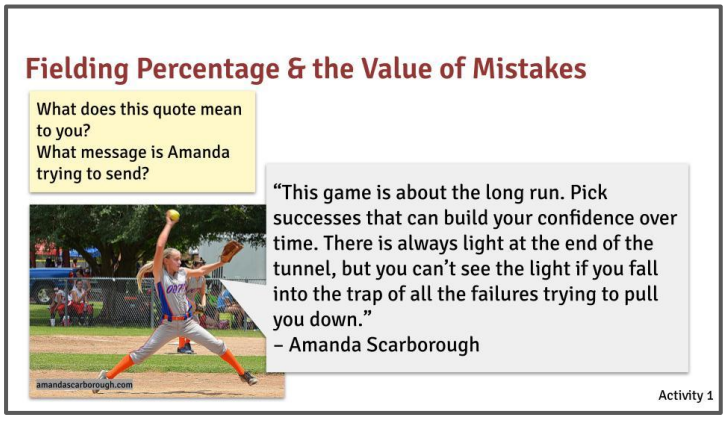
Start the session by providing youth with an overview of the key activities.



Fielding Percentage Youth Slides, Slide 1

Next, share and discuss this quote.

"This game is about the long run. Pick successes that can build your confidence over time. There is always light at the end of the tunnel, but you can't see the light if you fall into the trap of all the failures trying to pull you down."
- Amanda Scarborough



Fielding Percentage Youth Slides, Slide 2

Activity 1 - Measuring Fielding Using Fractions, Decimals, and Percent (1 of 7)

Description:

In this activity, youth practice their fielding skills and write down on their worksheets how many cards and/or balls they are able to catch. Youth will use fractions, decimals and percent to represent the proportion of 10 trials that resulted in a specific outcome (a "catch"). This activity will be done with baseball cards, tennis balls, and/or baseballs.

Math Ideas: Fractions, Decimals, and Percents

Youth use fractions, decimals and/or percents to represent the proportion of 10 trials that resulted in a specific outcome (a "catch"). With fractions, the denominator represents the total number of trials (in this case 10), and the numerator represents the number of trials that resulted in a specific outcome (catch). 2 catches out of 10 trials can be represented with the fraction 2/10. When fractions have a denominator of 10, they can be written as the decimal. For example, 2/10 can be written as 0.2, and 7/10 as 0.7. When fractions have a denominator of 10, they can also be written as an equivalent fraction with a denominator of 100. For example, 2/10 is equivalent to 20/100. Percent refers to a proportion out of 100, so fractions with denominators of 100 can be easily written as percents. For example, 20/100 (20 out of 100) is equivalent to 20%.

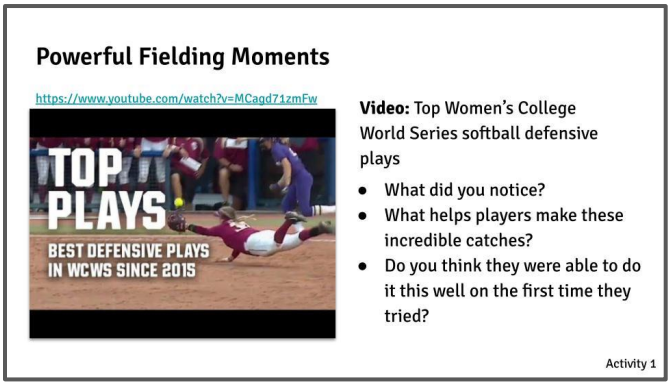
LAUNCH: Video of Fielding Moments

Show a video of powerful fielding moments:
Top WCWS softball defensive plays since 2015 (stop at 2:20 or 3:06)
https://www.youtube.com/watch?v=MCagd71zmFw

Ask youth to discuss what they notice in the video, and what helps players make these incredible catches and plays.

Discuss:

- What stood out in the video?
- How did players use their sight and reaction time to make these incredible plays?
- Which was your favorite?
- What do you think it takes to make plays like these? Do you think they were able to do it the first time they tried?



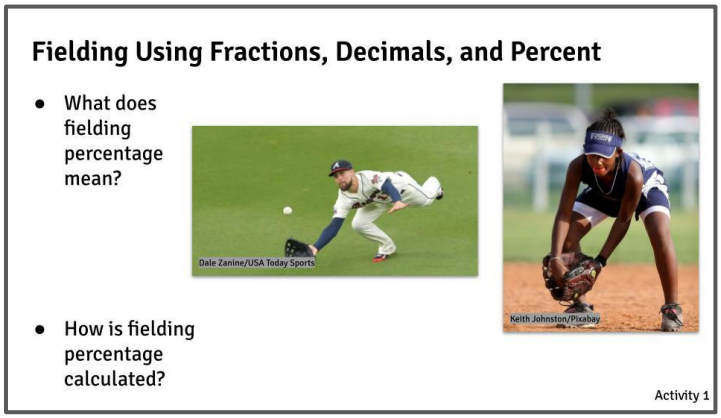
Fielding Percentage Youth Slides, Slide 3

Activity 1 - Measuring Fielding Using Fractions, Decimals, and Percent (2 of 7)

LAUNCH Connecting to Prior Knowledge:

Ask youth to share what they know about the concept of "fielding percentage":

- What does fielding percentage mean?
- How is fielding percentage calculated?

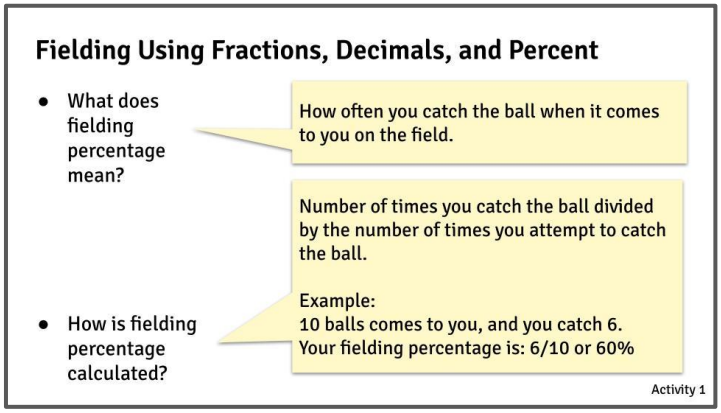


Fielding Percentage Youth Slides, Slide 4

Group Discussion: Meaning of Fielding Percentage

Explain the meaning of fielding percentage and provide several examples.

- If 10 balls come to you, and you catch 6, your fielding percentage is 6/10 or 60%
- What if 10 ball come to you and you catch 8, what is your fielding percentage?
- If you have a 70% fielding percentage, how many balls out of 10 do you expect to catch?



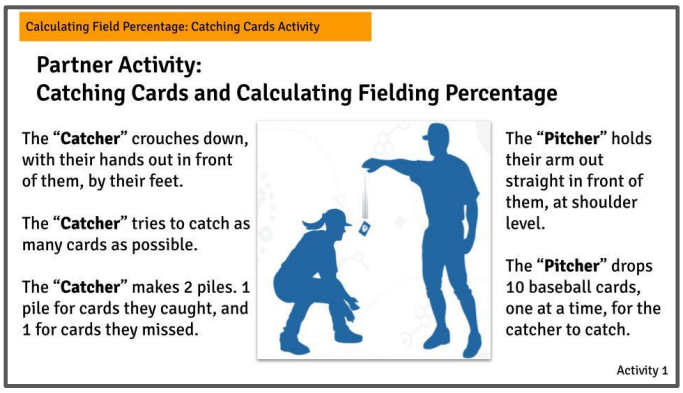
Fielding Percentage Youth Slides, Slide 5

Activity 1 - Measuring Fielding Using Fractions, Decimals, and Percent (3 of 7)

Demonstrate Partner Activity A: Catching Baseball Cards and Calculating Fielding Percentage

Tell youth they will practice their fielding percentage in a partner game that involves catching baseball cards.

Invite a youth to help you demonstrate the activity. You are the "Pitcher" and the youth is the "Catcher". **Model activity.** Pitcher drops 10 cards, one at a time, for the catcher to catch.



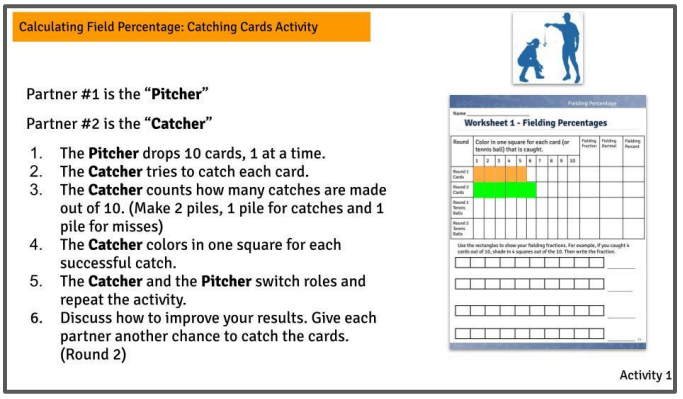
Fielding Percentage Youth Slides, Slide 6

Demonstrate how the **pitcher** should stand and extend their arm to drop the cards. The pitcher should hold the cards at shoulder height, or higher. Demonstrate how the **catcher** should crouch down and place their hands in the "ready position".

Instruct the catcher to place the cards they attempt to catch in one of two piles. One pile is for cards they catch, and the other pile is for cards they miss. This helps the catcher count how many cards were caught at the end of the activity.

Tell youth they will record the results on **Worksheet 1, by coloring in one square for each successful catch.**

The sample worksheet on Slide 7 shows 5 squares shaded for 5 successful catches in round 1, and 6 squares shaded for 6 successful catches in round 2.



Fielding Percentage Youth Slides, Slide 7

Partner Activity: Youth Complete the Card Catching Activity in Pairs

Youth will need notebooks and a pencil or marker for this activity. Ask youth to find a partner, and to designate one partner as the "**pitcher**" and the other partner as the "**catcher**". Distribute a set of 10 cards to each pair of youth.

Review the activity instructions on Slide 7.

1. The Pitcher drops 10 cards, 1 at a time.
2. The Catcher tries to catch each card.
3. The Catcher counts how many catches are made out of 10. (Make 2 piles, 1 pile for catches and 1 pile for misses)
4. The Catcher colors in one square for each successful catch.
5. The Catcher and the Pitcher switch roles and repeat the activity.
6. Discuss how to improve your results. Give each partner another chance to catch the cards. (Round 2)

Activity 1 - Measuring Fielding Using Fractions, Decimals, and Percent (4 of 7)

Demonstrate: Recording Outcomes Using Fractions, Decimals and Percents

Once all pairs have completed the activity, gather youth to discuss how to represent the results using fractions, decimals and percents. Start by asking students to share ideas and prior knowledge, using the prompt on Youth Slide 8.

Next, demonstrate how to represent fielding percentage using fractions, decimals and percents, using the examples and visual models on Youth Slides 9, 10 and 11.

Start by demonstrating how to represent the results as a **fraction** (Slide 9).

- 3 catches out of 10 total attempts = 3/10
- 7 catches out of 10 total attempts = 7/10

Explain that the numerator shows the number of successful catches, and the denominator shows the number of attempts.

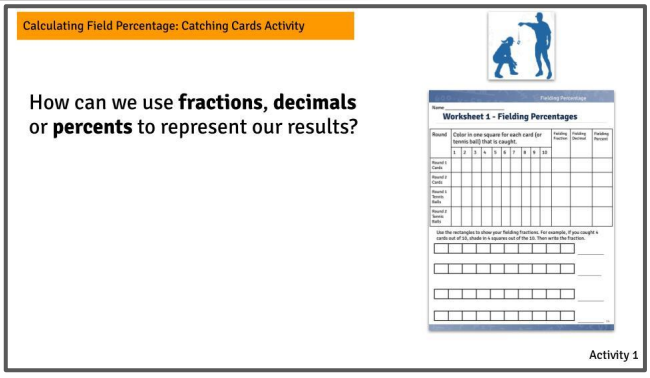
Then explain how to represent result with **decimals** (Slide 10)

Finally, show how to represent each result with a **percent**. (Slide 11) Explain that percents refer to parts out of 100.

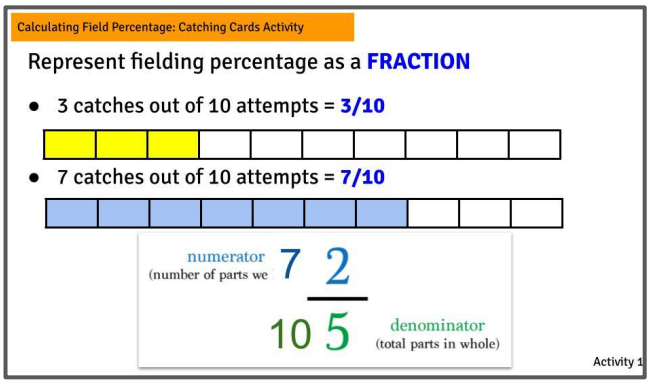
OPTION for older youth:

Share formula for fielding percentage:

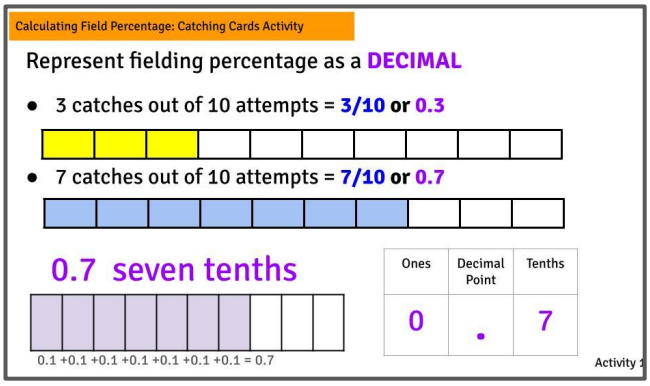
fielding % = $\frac{\text{(\# of catches)}}{\text{(\# of attempts)}} \times 100$



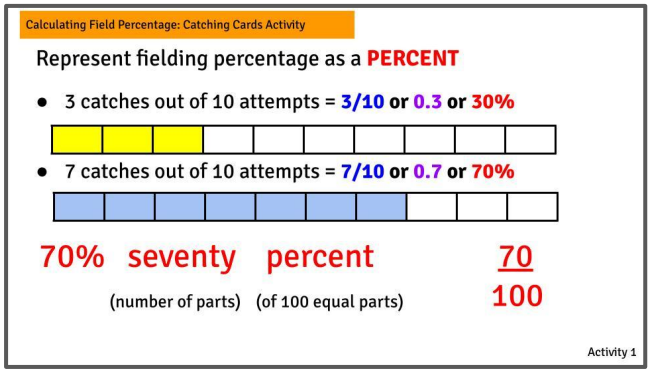
Fielding Percentage Youth Slides, Slide 8



Fielding Percentage Youth Slides, Slide 9



Fielding Percentage Youth Slides, Slide 10



Fielding Percentage Youth Slides, Slide 11

Activity 1 - Measuring Fielding Using Fractions, Decimals, and Percent (5 of 7)

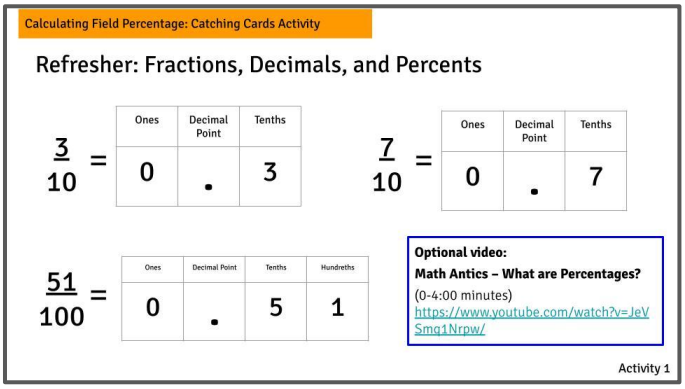
(If Needed) Provide additional support for fractions, decimals and percents

Review how to represent fractions with a denominator of 10 as decimals using the visuals on Slide 12. Emphasize how to read / say each value.

3/10 is “three-tenths”

0.7 is “seven-tenths”

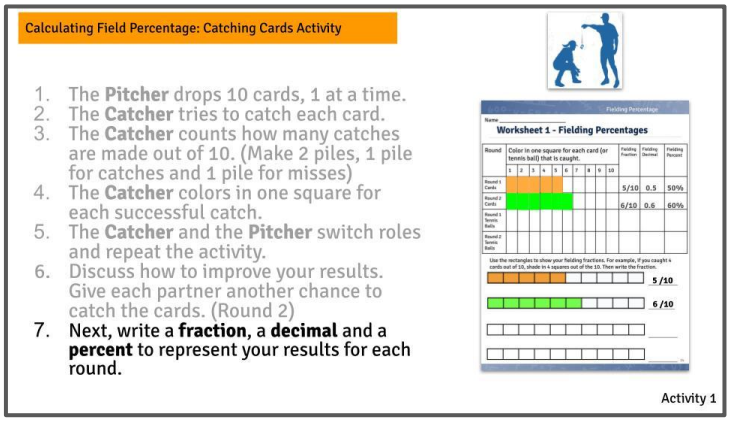
For additional support consider reviewing the ideas in this video https://www.youtube.com/watch?v=JeVSmq1Nrpw/ (0-4:00 minutes)



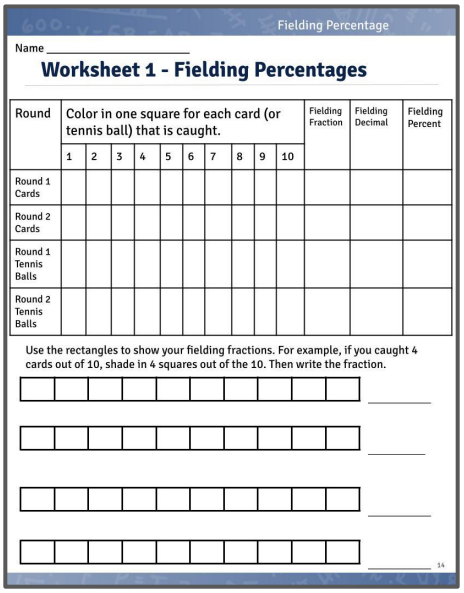
Fielding Percentage Youth Slides, Slide 12

Partner Activity (Cont.): Representing Results with Fractions, Decimals and Percentages

Ask youth to work with their partner to record the results of the card dropping activity using fractions, decimals and percents. The sample worksheet on Youth Slide 13 provides an example of how to record these results.



Fielding Percentage Youth Slides, Slide 13



Worksheet 1

Activity 1 - Measuring Fielding Using Fractions, Decimals, and Percent (6 of 7)

Whole Group Pop Up or Clap Game: Share and Discuss Fielding Percentage Results

Pop-Up and/or Clap Game: Tell youth that they will play a "pop up" (or clap) game to share their fielding percentage results. Read each statement below out loud. Ask youth to "pop up" (stand up) and/or clap if the statement is true for them (Youth Slide 14). Then call on different youth to explain their fielding percentage in a fraction, decimal or percent form.

Statement 1: If you caught exactly 5 of the 10 cards/balls, pop up!

- What is this result as a fraction? Explain how you know.
- What is this result as a decimal? Explain how you know.
- What is this result as a percent? Explain how you know.

Statement 2: If you caught exactly 70% cards/balls, pop up!

- What is this result as a fraction? Explain how you know.
- What is this result as a decimal? Explain how you know.

Statement 3: If you caught 8/10 or more of the cards/balls, pop up!

- What was your result as a decimal? Explain how you know.
- What was your result as a percent? Explain how you know.

Statement 4: If you caught 2 more cards/balls in the second round, compared to the first round, pop up!

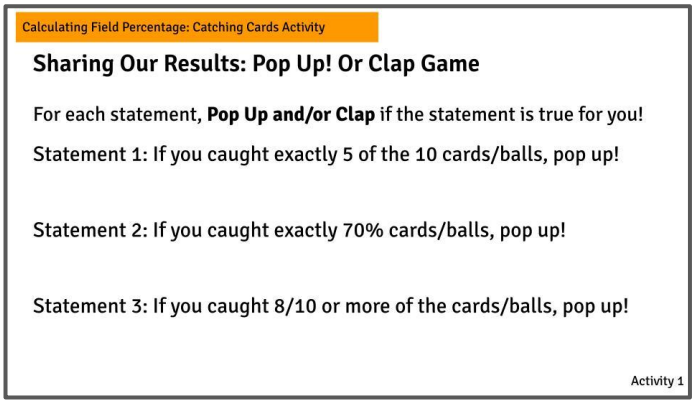
- What was your improved result as a fraction? Explain how you know.
- What was your improved result as a decimal? Explain how you know.
- What was your improved result as a percent? Explain how you know.

Group Discussion: Comparing Results to Typical Fielding Percentages

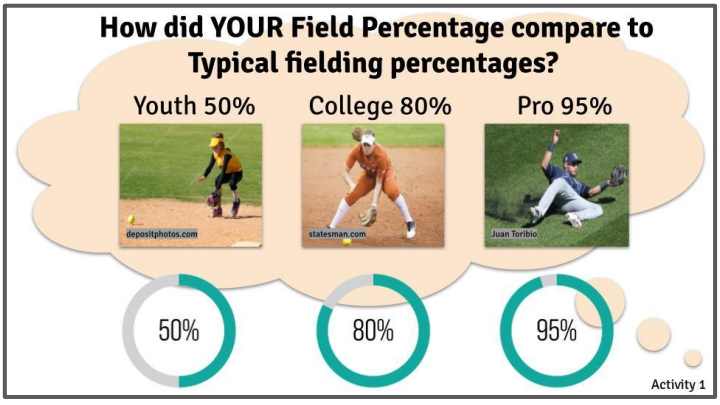
Wrap up the activity with a reflective discussion about the concepts in the activity.

Share the typical fielding percentage of players of different ages and levels of experience (Youth Slide 15).

- What do you notice about the different fielding percentages?
- How did your fielding percentage compare?
- What do you think the college and pro players do to have such a high fielding percentage?



Fielding Percentage Youth Slides, Slide 14



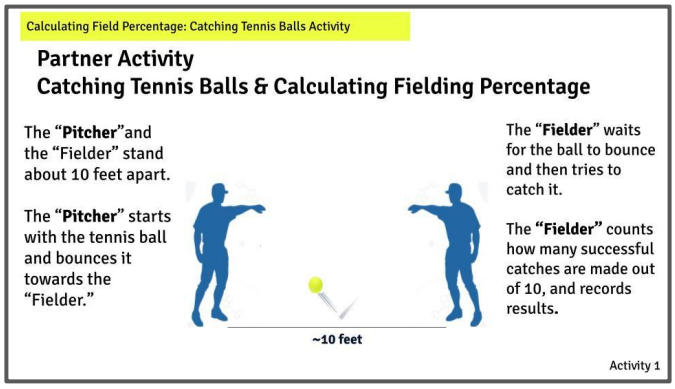
Fielding Percentage Youth Slides, Slide 15

Activity 1 - Measuring Fielding Using Fractions, Decimals, and Percent (7 of 7)

(Optional) Demonstrate Partner Activity B: Catching Tennis Balls and Calculating Fielding Percentage

Invite a youth to help you demonstrate this additional fielding activity.

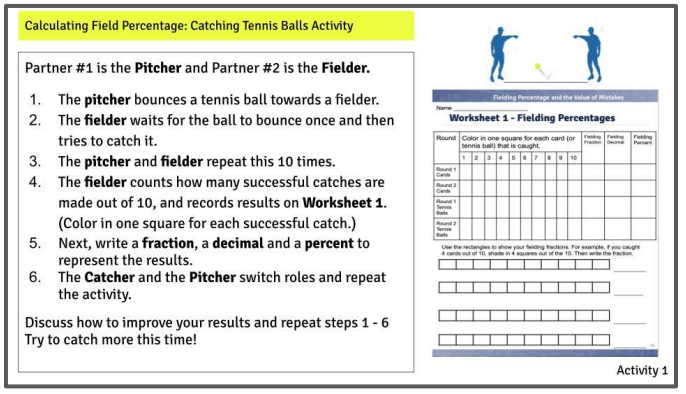
Model activity. You are the "Pitcher" and the youth is the "Fielder". Pitcher and fielder stand 10 feet apart. Pitcher bounces the ball towards the fielder. Fielder stands in the ready position (i.e., fielding position) facing the pitcher and ready to catch the bounced tennis ball.



Fielding Percentage Youth Slides, Slide 16

(Optional) Transition to Youth Partner Activity B: Catching Tennis Balls

Youth will need notebooks and a pencil or marker for this activity. Ask youth to find a partner. One partner is the "**pitcher**" and the other is the "**fielder**". Distribute a tennis ball to each pair of youth.



Fielding Percentage Youth Slides, Slide 17

Review activity instructions:

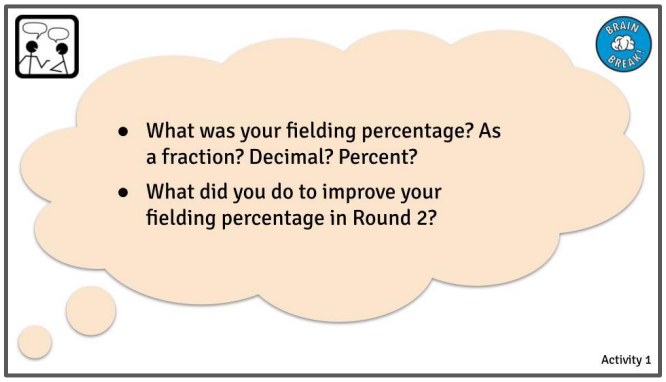
- The **Pitcher** bounces a tennis ball towards a fielder.
- The **Fielder** waits for the ball to bounce once and then tries to catch it.
- The pitcher and fielder repeat this 10 times.
- The **Fielder** counts how many successful catches are made out of 10. The **Fielder** colors in one square for each catch on **Worksheet 1.**
- The **Fielder** writes a fraction, decimal and a percent to represent the results.
- Catcher and Fielder switch roles and repeat the activity.
- Discuss how to improve results and repeat steps 1 - 6.

TIP: If you have space, let youth field balls

CLOSURE Reflection:

Wrap up the activity with a reflective discussion about key concepts.

- What was your fielding percentage as a fraction? A decimal? A percent?
- What adjustments did you make to improve your fielding percentage in Round 2?



Fielding Percentage Youth Slides, Slide 18

Activity 2 - Learning from Mistakes (Growth Mindset Connection) (1 of 3)

Description: In this activity, youth will watch a video and discuss how they can learn from mistakes. Youth set SMART goals related to new challenges.

Growth Mindset Ideas:

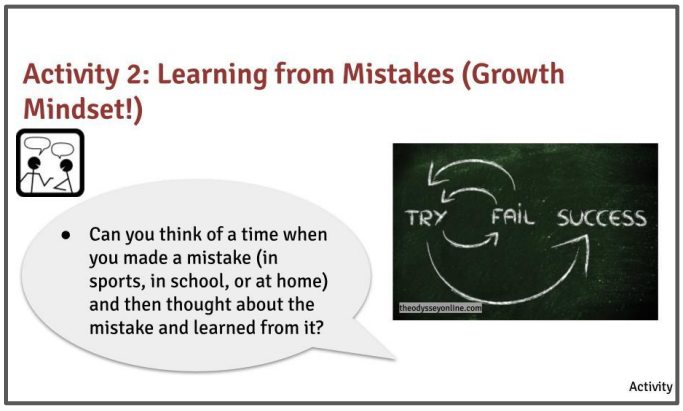
MISTAKES - When we make mistakes, and reflect on those mistakes, this supports our learning. In fact, considering our mistakes actually promotes brain growth! Our brains are literally growing, changing, and adapting as we consider our mistakes, and learn from them. Even professional athletes make mistakes, and value mistakes as part of learning.

EFFORT AND PERSISTENCE - Goal setting with a growth mindset focuses on believing you can improve. When you have a growth mindset you believe that you can make significant changes with effort and persistence. When you write down your goals, you are more likely to achieve them. When you set SMART goals, goals that are Specific, Measurable, Actionable, Realistic and Timely, you are more likely to achieve your goals.

LAUNCH Connecting to Prior Knowledge:

Ask youth to discuss how they can learn from mistakes.

- How do baseball players learn from their mistakes?
- Can you think of a time when you made a mistake (in sports, in school, or at home) and then thought about the mistake and learned from it?



Fielding Percentage Youth Slides, Slide 19

Demonstrate that Mistakes Support Learning: Video and Discussion

Show a video that addresses how mistakes can support learning. There are two video options.

OPTION #1: A coach explains how players can deal with mistakes. https://devzone.positivecoach.org/resource/video/failing-one-time-doesnt-make-you-failure

- What was the coach's main message?
- Why does he say "failing doesn't make you a failure"?

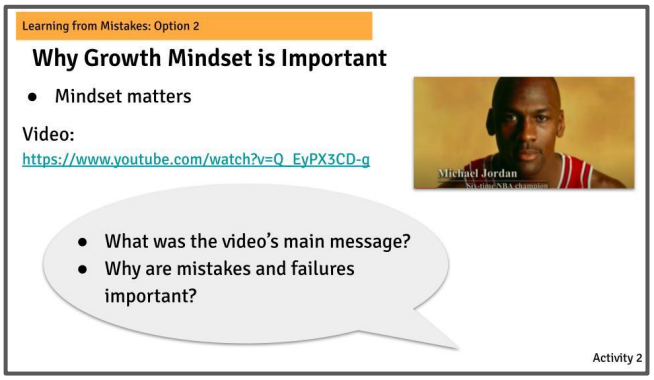
Fielding Percentage Youth Slides, Slide 20
Video Option #1

Activity 2 - Learning from Mistakes (Growth Mindset Connection) (2 of 3)

Demonstrate That Mistakes Support Learning: Video and Discussion

OPTION #2: Michael Jordan has a growth mindset towards mistakes. https://www.youtube.com/watch?v=Q_EyPX3CD-g

- What was the video's main message?
- Why are mistakes and failures important?



Fielding Percentage Youth Slides, Slide 21
Video Option #2

Introduce SMART Goals:

Explain to youth that when they are learning something new, setting **SMART Goals** can help them to make progress towards their goal.

In this activity youth will focus on the **S**, **M**, and **R** features of SMART goals.

- S → Specific (clear goal that you would like to achieve)
- M → Measurable (your goal should be easy to measure and track in days or weeks)
- R → Relevant (your goal should relate to something that is important to you)

Fielding Percentage Youth Slides, Slide 22

To support youth understanding of SMART goals, share an example of a SMART goal you have for your own learning and progress. Here is an example:

My Goal: To run 1 mile in less than 10 minutes by October 1.

- **Specific:** this goal is specific because it says the distance I plan to run.
- **Measurable:** this goal is measurable because I can measure how far I run and the time of my run.
- **Relevant:** this goal is important to me because I want to improve my stamina, and eventually I want to be able to run a 5K race.

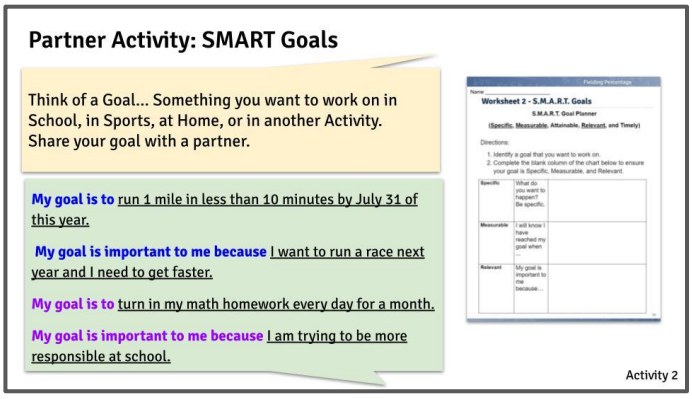
Activity 2 - Learning from Mistakes (Growth Mindset Connection) (3 of 3)

Partner Activity: Writing SMART Goals

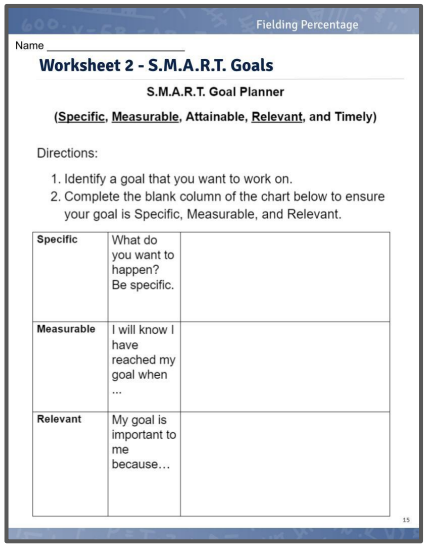
Tell youth to brainstorm a goal (for school, for sports, or another activity).

Ask youth to share their goal with a partner, and record their goal on **Worksheet 2.**

Then, ask youth to volunteer to stand up and share their goal aloud.



Fielding Percentage Youth Slides, Slide 23

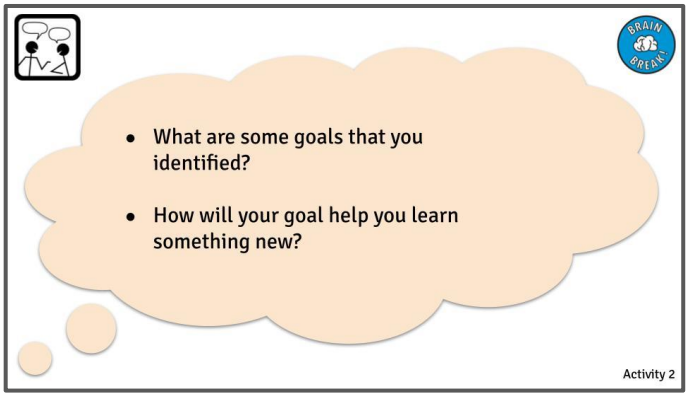


Worksheet 2

CLOSURE Reflection:

Wrap up the activity with a reflective discussion about the concepts in the activity and the driving questions for the lesson.

- What are some goals that you identified?
- How will your goal help you learn something new?



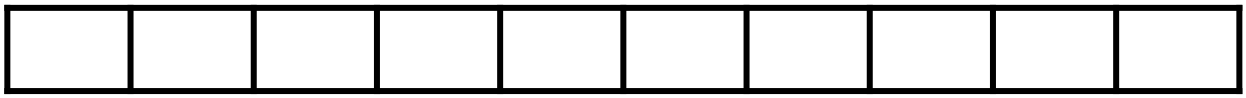
Fielding Percentage Youth Slides, Slide 24

Name _____

Worksheet 1 - Fielding Percentages

Round	Color in one square for each card (or tennis ball) that is caught.										Fielding Fraction	Fielding Decimal	Fielding Percent
	1	2	3	4	5	6	7	8	9	10			
Round 1 Cards													
Round 2 Cards													
Round 1 Tennis Balls													
Round 2 Tennis Balls													

Use the rectangles to show your fielding fractions. For example, if you caught 4 cards out of 10, shade in 4 squares out of the 10. Then write the fraction.



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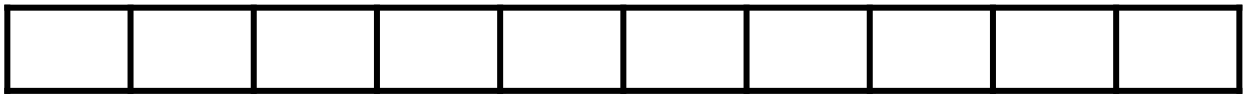

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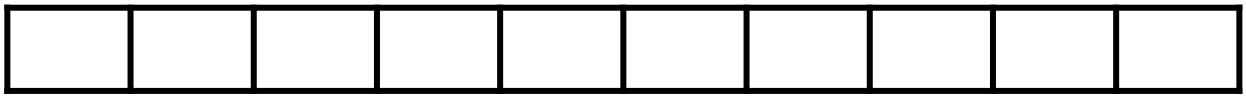

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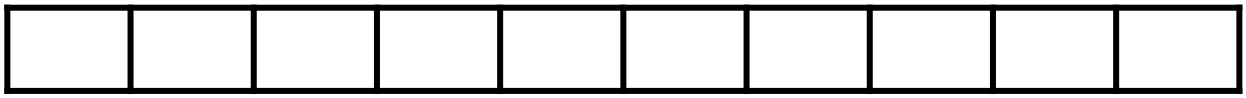

_____

Name _____

Worksheet 2 - S.M.A.R.T. Goals

S.M.A.R.T. Goal Planner

(Specific, Measurable, Attainable, Relevant, and Timely)

Directions:

1. Identify a goal that you want to work on.
2. Complete the blank column of the chart below to ensure your goal is Specific, Measurable, and Relevant.

Specific	What do you want to happen? Be specific.	
Measurable	I will know I have reached my goal when ...	
Relevant	My goal is important to me because…	