

# One Base Baseball

by Dennis Robbins and Melissa Woods

Big Idea for Physical Education	Big Idea for Science
Movement Competency	Forces and Changes in Motion
<b>Standards</b>	
<p><b>PE.4.M.1.4:</b> Strike moving and/or stationary objects with long-handled implements (wiffle ball bat, tennis racket, pool noodle) using correct technique so the objects travel in the intended direction.</p> <p><b>SC.4.P.12.2:</b> Investigate and describe that the speed of an object is determined by the distance it travels in a unit of time and that objects can move at different speeds.</p> <p><b>SC.4.N.1.1</b> Raise questions about the natural world, use appropriate reference materials that support understanding to obtain information (identifying the source), conduct both individual and team investigations through free exploration and systematic investigations, and generate appropriate explanations based on those explorations.</p>	
<b>Learning Goals for integrated lesson plan</b>	
<p>The student will</p> <ul style="list-style-type: none"> <li>● strike a wiffle ball using a wiffle ball bat with the correct technique and form, so as to send the ball in the intended direction in both One Base Baseball and hitting for distance attempts.</li> <li>● use correct hand positioning on the bat handle, grip, and correct pre-swing form and follow through.</li> <li>● analyze data to determine what is the best type of swing to strike a wiffle ball.</li> <li>● investigate the speed of an object.</li> <li>● describe that the speed of an object is determined by the distance it travels in a unit of time.</li> <li>● recognize that objects can move at different speeds.</li> </ul>	
<b>Vocabulary common to both disciplines</b>	
<ul style="list-style-type: none"> <li>● distance</li> <li>● force</li> <li>● friction</li> <li>● gravity</li> </ul>	<ul style="list-style-type: none"> <li>● motion</li> <li>● strike</li> <li>● speed</li> <li>● trajectory</li> </ul>
<b>Idea for bringing PE implements into science classroom</b>	
<p>Data to be collected would be the distance traveled from the tee to where the ball comes to rest in a hitting for distance competition. An extension may be the differences in the travel distance when the ball is pitched as opposed to being hit off the tee. Taking the science class outside to also demonstrate/practice different types of swings (pulling, slicing, punch hitting) and how they impact the trajectory of the ball and also the distance travelled. Do slices travel farther when hitting for distance than pulling type hits?</p>	
<b>Summary of Physical Education Activity</b>	<b>Summary of Science Investigation</b>
Students will play One Base Baseball while learning about different types of swings and how to strike using a long handled implement.	Students will use wiffle ball bats to strike different types of balls and investigate the speed of the different balls.

Assessment Tools - PE	Assessment Tools - Science
The assessment tool used would be the performance task.	The assessment tool is the student record sheet and the CER activity following the investigation.
Integrated Assessment	
Integrated Assessment is the hitting for distance activity. This is where types of swings would come into play as experimenting with what type of swing works best for each hitter to achieve greater distances while hitting.	

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Duration of Lesson
40 minutes
Setup/Materials
<p>Materials:</p> <ul style="list-style-type: none"> <li>• 7 batting tees or different size cones which can be used as tees</li> <li>• 1 wiffle ball per tee</li> <li>• 2 Poly Spots per tee</li> <li>• 1 Hula Hoop per tee</li> <li>• extra wiffle balls at each station for warm up batting practice.</li> <li>• One Base Baseball Student Recording Sheet (attached)</li> </ul> <p>Setup:</p> <p>Place one poly spot in front of the tee as home plate and another is placed about 20 feet straight out in front of the tee. A hula hoop is placed in the middle at the halfway point.</p>



### Teacher Notes

Batting tees don't have to be used. Different sized cones are an excellent alternative. Bases can be poly spots, field paint, or anything that is flat.

### Safety

Discuss the importance of safety when using a bat. Remind students not to walk behind someone swinging a bat. Batters should be aware of their surroundings when swinging. Batting areas should be lined with cones, jump ropes, or field paint. This will deter students from walking up behind a batter. Students should not handle the bats until the other players in the game are out in the field. Review how to appropriately drop the bat after hitting (not tossing the bat behind them or releasing it on follow-through) in order to maintain safety.

### Procedure

#### **Activity 1- Mechanics and Guided Practice**

Demonstrate- Proper mechanics for striking a ball with a bat

- Review Safety- Students will be the physical layout of the batting area, when to pick up a bat and swing, and where they should be standing.

### Skill Cues for Striking/Hitting using a bat

- Athletic Stance (feet shoulder width apart, knees bent)
- Grip Together, Line of Knuckles
- Bat Up, Grip at Armpit
- See Ball from Start to Finish
- Rotate Hips; Drive Body Through the Ball
- Guided Practice- organize students into groups of 3.
- Identify one player as Apple, another as Orange and the third as Banana

Send Apple and Orange into the field, Banana will practice swing first.

Each player takes 5-7 practice swings with teacher observation and feedback

Players in the field should complete fitness activities or dynamic stretches while awaiting their turn.

### Activity 2- One Hit Baseball

A poly spot is placed in front of the tee as home plate and another is placed about 20 feet straight out in front of the tee. A hula hoop is placed in the middle at the halfway point. Designate one of the three groups members (Apple) to be the batter first, followed by Orange and then Banana.

Apple (and subsequent batters) hits the ball and runs to the base, touches it and returns to home. He/she continues until one of the two defensive players gets the ball and gets in the hula hoop and yells freeze.

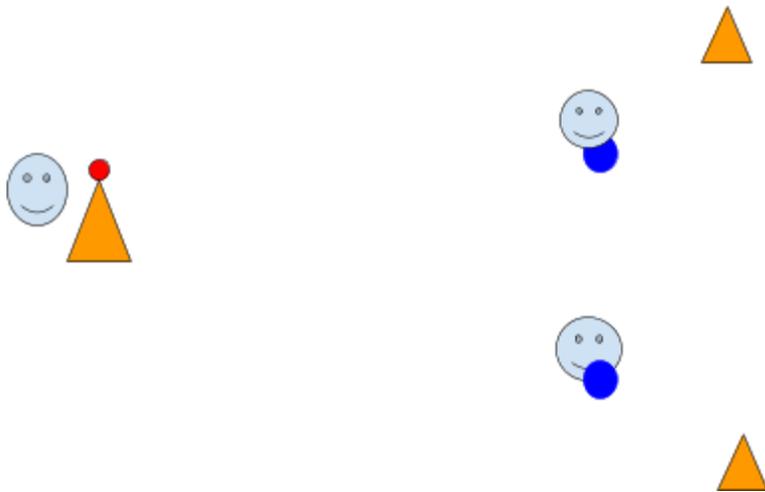
Then a new batter comes up to hit. There are no outs. Scores are cumulative and carry over to the next time each student bats.

### Activity 3- Home Run Derby

This activity can use a similar set up to One Hit baseball but remove the hoop. Cones can be set up prior but not used until this activity.

The object of the game is for the batter to score as many Home Runs as possible by hitting the ball off the cone (tee) and landing it beyond the fence cones without being caught by an outfielder. Outfielders will try to catch each hit before the ball touches the ground.

After Player 1 hits 3 balls as the batter, rotate so that Player 2 becomes the new batter and Players 1 and 3 are outfielders. On the next rotation, Player 3 becomes the batter. Continue this pattern until you hear the stop signal. Keep track of how many Home Runs you score.



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Duration of Lesson
3 days (three 30-minute lessons)
Teacher Notes
This lesson should be taught following the PE activities.
Safety
Make sure students stand away from the student who is swinging the wiffle ball bat. Students who are marking the location of where the ball lands should be paying attention at all times to avoid being hit by the ball. Student timers and distance measurers should stand to the side of the tee or cone, far enough to avoid the swing of the bat.
Materials
Materials per group: <ul style="list-style-type: none"><li>● batting tee (or cone to be used as a tee)</li><li>● wiffle ball bat</li><li>● wiffle ball</li><li>● tennis ball</li><li>● Nerf ball</li><li>● measuring tape or trundle wheel</li><li>● timer</li></ul> Materials per student: <ul style="list-style-type: none"><li>● One Base Baseball Student Recording Sheet (attached)</li><li>● pencil</li><li>● clipboard</li><li>● calculator</li></ul>
Procedure
<b>Day 1</b> <ol style="list-style-type: none"><li>1. Begin with a discussion of the physical education lesson on striking with long-handled implements.<ol style="list-style-type: none"><li>a. Have students turn and talk to a shoulder partner. Ask them to describe the motion of the wiffle ball when it was hit with each of the different long-handled implements (wiffle ball bat, pool noodle, PVC, etc.). Have student pairs share out with the whole class.</li><li>b. Tell students to think about the distance the wiffle ball traveled when it was hit with different long-handled implements. Ask the students to discuss the following questions with a shoulder partner:<ul style="list-style-type: none"><li>● Which implement caused the ball to travel the furthest distance?</li><li>● Which caused the ball to move the fastest?</li></ul></li><li>c. Have students share out with the whole group.</li></ol></li><li>2. Ask the students to think about how the distance a ball travels would change if they used different types of balls. How would the type of ball affect the speed the ball moves?</li><li>3. Explain that students will be conducting an investigation to determine which type of ball travels the fastest when hit with a wiffle ball bat. Ask the students to discuss how to test which ball would move the fastest.</li></ol>

4. Divide students into groups of four. Pass out the student record sheets. Discuss the question, "Does the type of ball affect the speed the ball moves when hit/struck with a wiffle ball bat?"
5. Have the students read the hypothesis statement on the record sheet and write their hypothesis. "If we hit/strike a wiffle ball, a tennis ball, and a Nerf ball with a wiffle ball bat, then the \_\_\_\_\_ will move the fastest.
6. Tell the students they will test the question in the next class. Explain how students will test this question.
  - a. Students will work in groups of 4, and each student will have an assigned role:
    - Striker (student who hits each ball with the wiffle ball bat)
    - Timer (student who times the motion of the ball- from the time it is hit until it touches the ground)
    - Ball marker (student who marks the spot where the ball hits the ground)
    - Distance measurer (student who measures the distance from batting tee/cone to the ball marker)
  - b. The testing process:
    - The striker will place the wiffle ball on the tee/cone and will strike the ball with the wiffle ball bat.
    - The timer will start the timer when the bat hits the ball and will stop the timer when the ball hits the ground. All students will record the time on the student record sheet.
    - The ball marker will move to the place where the ball hits the ground and stand there until the distance measurer measures the distance.
    - The distance measurer will use a tape measure/trundle wheel to measure the distance from the tee to the ball. All students will record the distance in meters on the record sheet.
  - c. Talk with the students about the need to have a control- a standard swing. Tell the students that it is important for the results that all strikers hold the bat the same way, start the bat in the same position, and use the same amount of force when swinging the bat. Have a student volunteer to stand up to demonstrate the standard swing based on class input.
  - d. Explain that students will complete this process three times for each type of ball.

## Day 2

1. Assign a role to each student. Have the strikers stand up and practice the standard swing.
2. Students will test the question, "Does the type of ball affect the speed the ball moves when hit/struck with a wiffle ball bat?" They will complete the following steps 3 times with the wiffle ball.
  - a. The striker will place the wiffle ball on the tee/cone and will strike the ball with the wiffle ball bat.
  - b. The timer will start the timer when the bat hits the ball and will stop the timer when the ball hits the ground. All students will record the time on the student record sheet.
  - c. The ball marker will move to the place where the ball hits the ground and stand there until the distance measurer measures the distance.
  - d. The distance measurer will use a tape measure/trundle wheel to measure the distance from the tee to the ball. All students will record the distance in meters on the record sheet.
3. Students will complete the testing steps 3 times with the tennis ball.
4. Students will complete the testing steps 3 times with the racket ball.
5. Tell the students they will calculate the speed from their data and analyze the results in the next lesson.

**Day 3**

1. Review the testing process from the previous class. Explain that students will be calculating the average speed for each ball tested by dividing the distance by the time. Show the students how to calculate the average speed using the calculator. They should record the average speed for each ball in the student record sheet.
2. Once students calculate the average speed for each test, they should use the average speed to rank the types of balls from fastest to slowest. Point out to students that the lowest time is the fastest time.
3. Direct the students to look back at their hypotheses. Did the results support the hypothesis? Why or why not? Students should complete the Claims- Evidence- Reasoning section on the student record sheet using the data they collected.

# One Base Baseball Student Record Sheet

**Question**

Does the type of ball affect the speed the ball moves when hit/struck with a wiffle ball bat?

**Hypothesis**

If we hit/strike a wiffle ball, a tennis ball, and a Nerf ball with a wiffle ball bat, then the \_\_\_\_\_ ball will move the fastest.

**Data Table**

Type of Ball	Wiffle Ball			Tennis Ball			Nerf Ball		
	Distance (cm)	Time (sec)	Average speed (distance/time)	Distance (cm)	Time (sec)	Average speed (distance/time)	Distance (cm)	Time (sec)	Average speed (distance/time)
<b>Test 1</b>									
<b>Test 2</b>									
<b>Test 3</b>									

Calculate the average speed for each ball using a calculator. Divide the distance by the time. Record the average speed for each test in the correct column.

Now look back at the table and circle the fastest time for each type of ball.

**Rank the Types of Balls by Average Speed**

Type of Ball from Fastest to Slowest (The fastest ball has the LOWEST time)	Average Speed

## Conclusion

Write a scientific explanation that answers the question: Does the type of ball affect the speed the ball moves when hit/struck with a wiffle ball bat?

## Claim

Write a sentence that states if the type of ball affects the speed it moves when struck with a wiffle ball bat.

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## Evidence

Provide scientific data to support your claim. The evidence should include the average speed.

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## Reasoning

Explain why your evidence supports your claim. Describe how you calculated average speed and why your evidence allowed you to determine if the type of ball affects the speed the ball moves when struck with a wiffle ball bat.

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## One Base Baseball: Student Roles

### Striker

Student who hits each ball with the wiffle ball bat.



### Timer

Student who times the motion of the ball from the time it is hit until it touches the ground.



### Ball Marker

Student who marks the spot where the ball hits the ground.



### Distance Measurer

Student who measures the distance from batting tee/cone to the ball marker.



Bat and Tee picture

<https://www.maxpixel.net/Wiffle-Competition-Leisure-Recreation-Ball-Action-3288355>

Timer picture

[https://commons.wikimedia.org/wiki/File:Schlagzahluhr\\_stroke-timer\\_ST-X3.jpg](https://commons.wikimedia.org/wiki/File:Schlagzahluhr_stroke-timer_ST-X3.jpg)

Marker picture

<https://www.flickr.com/photos/lisannekeir/8046243737/>

Trundle wheel picture

