

# Casey at the Bat and the Pop Fly Challenge

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## *4-5 Grade STEM Start-Ups*



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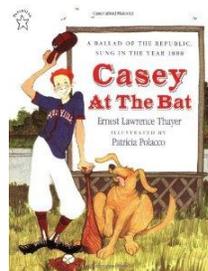
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## 1. CASEY AT THE BAT AND THE POP FLY CHALLENGE (4-5)

Primary Resource: *Casey At The Bat* by Ernest Lawrence Thayer

Adapted by: LearnZillion.com / Design Squad



### 1.1. INTRODUCTION

The Mudville baseball team is losing by two runs in the last inning. Both the team and its fans believe if Mudville's star player, Casey, can get to bat they will win the game. The first two players (Cooney and Barrows) fail to get on base. The next two batters (Flynn and Jimmy Blake) are perceived as weak hitters but surprisingly Flynn hits a single and Blake follows with a double allowing Flynn to reach third base. Both runners are in scoring position when the overconfident Casey steps up to the plate. Casey, being full of himself, decides not to swing at the first two pitches. "Strike one!" "Strike two!" On the last pitch Casey swings with all his might and strikes out, ending the game and sending the crowd home unhappy.

Using the poem, *Casey At The Bat* by Ernest Lawrence Thayer, students will read closely and gain a better understanding of the poem by retelling what occurs in each stanza. In addition, students will dive deeper into the poem and answer common core base questions for understanding.

Finally, students will complete an exciting design challenge. Baseball players use levers every time they are up to bat. Students will learn, research, and create a lever (catapult) that will send a ping pong ball flying in the air high enough to be caught. Students will engage effectively in collaborative discussions with diverse partners and build on others' ideas and express their own clearly. They will review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.

### 1.2. MATERIALS

- *Casey At The Bat* Poem by Ernest Thayer (Picture book, YouTube video, PDF)
- Paint Stirrers
- Ping Pong Balls
- 3oz Cups
- Wooden Block or Spool
- Duct Tape

## 1.3. LANGUAGE ARTS WORK

### 1.3.1. EXPLORE THE TEXT

Students will gain a better understanding of the poem by retelling what happens in each stanza. Students will create the following chart (Figure 1) in their notebooks for all 15 stanzas of the poem.

Stanza	What is happening?
1	The Mudville baseball team must be losing. The game is almost over and it is not looking good for the Mudville team.
2	People are starting to leave. People want Casey because they think he is a good hitter.
3	

Figure 1: Poem Chart

### 1.3.2. PART 2

Students will read for a better understanding of the text by answering the following questions in their reading journals:

- Please list three words from the title or first stanza that indicate that the poem is about baseball.
- Who are the “patrons of the game?”
- What do we know about Casey’s baseball ability from the poem? Please support your answer with at least one direct or indirect quote from the text.
- According to the poem, how many people are at this baseball game?
- The author uses a simile to compare the sound of the crowd to the sound of \_\_\_\_\_.

## 1.4. DESIGN CHALLENGE

Levers, levers, everywhere. Who doesn’t want to get more done with little effort? Baseball players use a lever every time they are up to bat. When you swing a bat, you move the part you’re holding just a little bit. But the other end of the bat moves quite a lot. Hundreds of years ago, soldiers hurled heavy rocks using catapults, which use a lever system to send them flying.

Your task is to research and answer the following questions:

- What is a lever?
- How does a lever work?
- What are the different parts of a lever?
- How will using a lever help you launch the ball high enough so you can catch it?
- What force will you use to send your Ping Pong ball flying?

The goal is to research and invent a lever (catapult) to send a ping pong ball flying high enough to catch it only using the materials given.

### 1.5. DESIGN PROCESS

In their journal the students will answer the following questions:

- Ask:
  - What is the problem?
  - What are the materials?
  - What are the constraints?
- Brainstorm:
  - What are some ideas?
- Plan:
  - Draw and label a sketch for your solution
- Test
  - Was your challenge successful? Why or why not?
- Improve/Reflection:
  - If you were to do the challenge over, what would you keep the same and what would you do differently? (Justify/Provide evidence for each answer.)

### 1.6. RUBRIC

Category	Developing (1)	Good (2)	Excellent (3)	Score
Language Arts Work	Answers are not correct. Evidence from the text does not correlate with the questions.	Answers are on track but not fully correct. Evidence from the text is attempted to support answer.	Questions are answered correctly with evidence from the text to support answer.	
Design Process	<b>Brainstorming:</b> Ideas are unclear to connect to problem. <b>Plan/Create/Build:</b> The design and model is not aligned with the criteria, constraints, and intent of the problem. <b>Improve/Reflection:</b>	<b>Brainstorming:</b> Ideas are somewhere aligned to problem but need explanation to make clear. <b>Plan/Create/Build:</b> The design and model is somewhat aligned with the criteria, constraints, and intent of the problem.	<b>Brainstorming:</b> Ideas are aligned to problem. <b>Plan/Create/Build:</b> The design and model is aligned with the criteria, constraints, and intent of the problem. <b>Improve/Reflection:</b> Student explains what	

	Student only explains one concept either what would be kept the same or what would be changed. Also, does not provide evidence for response.	<b>Improve/Reflection:</b> Student explains what would be kept the same and what would be changed, but does not provide evidence for response.	would be kept the same and what would be changed. Provides evidence for response.	
<b>Collaboration</b>	Ignores others and distracts others. Shows no understanding of project and negative. Will argue with others and does not ask or answer any questions.	Listens respectfully and follows directions. Shows understanding of project and sometimes argues with others. Asks and answers questions	Listens respectfully and engages in discussion. Shows understanding of project and positive. Never argues with others. Asks and answers questions and will provide evidence to support answer	

## 1.7. RESOURCES

This 5 Step Engineering Design Process template can help the students answer the questions for the design process during their challenge:

- The Works: The Hands On Museum <http://teachers.egfi-k12.org/wp-content/uploads/2010/05/Post-lesson-Student-Activities-Engineers-and-the-Engineering-Design-Process.pdf>
- Design Squad: This is the lesson for the catapult. For extra information and guidance with the design challenge. <http://pbskids.org/designsquad/build/pop-fly/>