

Peg + Cat: The Racecar Problem

2-5 Grade STEM Start-Ups



Developed by:

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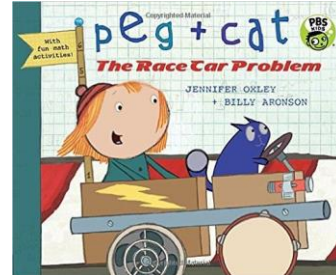
TABLE OF CONTENTS

Table of Contents.....	2
1. Peg + Cat: The Racecar Problem	3
1.1. Introduction	3
1.2. Materials	3
1.3. Language Arts Work	4
1.3.1. Explore The Text	4
1.3.2. Part 2	4
1.4. Design Challenge	5
1.5. Design Process	5
1.6. Rubric	5
1.7. Resources	6

1. PEG + CAT: THE RACECAR PROBLEM

Primary Resource: *Peg + Cat: The Racecar Problem* by Jennifer Oxley and Billy Aronson

Adapted by: LearnZillion.com



1.1. INTRODUCTION

Peg and Cat have built a race car out of things lying around their house and they plan to win the Tallapegga Twenty. Will Peg and Cat come in first place and win the Golden Cup? Or will it be one of their silly competitors? In this lesson, students will use the picture book, *Peg + Cat: The Racecar Problem*, students will learn about the structure of a text and plot by using a story arc. In addition, students will explain how the main character responds to challenges in the text and will provide details from the text to support the theme.

Finally, students will complete a fun design challenge, making a car move down a track without touching it, building a ramp, or changing the track. In this deep thinking challenge, 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 in the text and draw conclusions in light of information and knowledge gained from the discussions.

1.2. MATERIALS

- *Peg + Cat: The Racecar Problem* by Jennifer Oxley and Billy Aronson Book / PDF / YouTube video
- Matchbox Cars
- A Level Table
- Tinker Supplies – things around the classroom such as magnets, straws, tape, balloons, string, paper, etc.

1.3. LANGUAGE ARTS WORK

1.3.1. EXPLORE THE TEXT

Teacher will read aloud or have students watch *Peg + Cat: The Racecar Problem* using the Picture Book, PDF, or YouTube video.

- Using the story arc provided below (see Figure 1) students will fill in with answers or questions of their own. For example, younger students (grades 2-3) can answer the questions provided on the story arc while older students (grades 4-5) can come up with their own questions and answers for the arc.

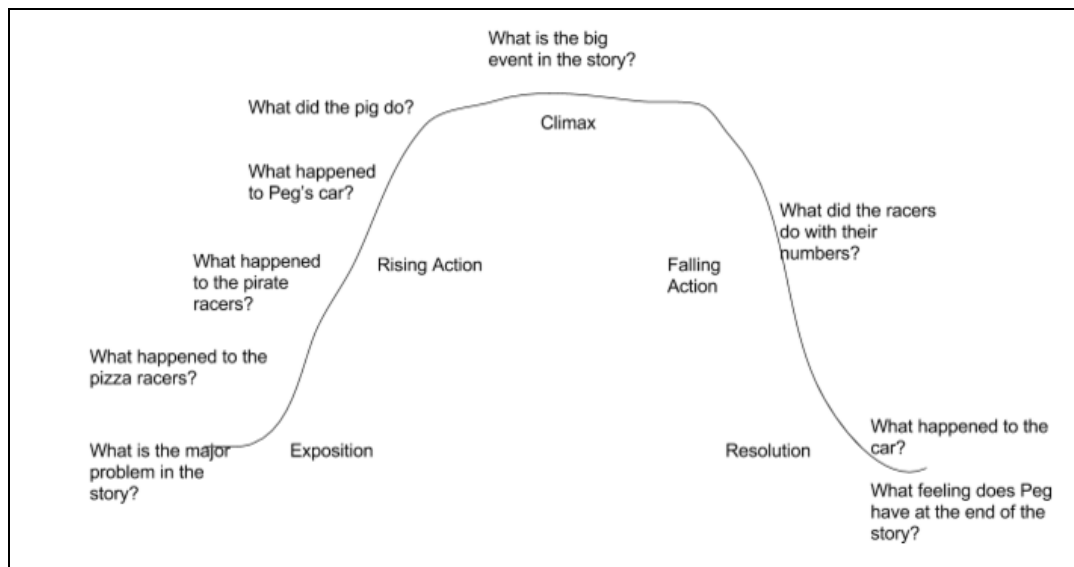


Figure 1: Peg + Cat The Race Car Problem Story Arc

1.3.2. PART 2

Students will read again closely and will answer the following questions in their reading journal:

Theme: Perseverance (i.e. not giving up)

- How did Peg respond to her challenges?
 - Losing a wheel?
 - Seeing the other cars?
 - When her car fell apart during the race?
- Please give two details, examples, or quotes of Peg and Cat persevering or not giving up.

1.4. DESIGN CHALLENGE

Peg and Cat have signed up for the next race at Eldora Speedway! However, as we know from the story, at the end of the Tallapegga Twenty, the car fell apart. The good news is your teacher will provide a matchbox car for Peg to use. The bad news is her car won't move! Your task is to help Peg make her car move so she can be competitive in the race. You may use things around the classroom such as magnets, straws, tape, balloons, string, paper, etc. The goal is to race your car from one end of the table to the other without touching the car, changing the track, building a ramp, or lifting the table.

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	Brainstorming: Ideas are unclear to connect to problem. Plan/Create/Build: The design and model is not aligned with the criteria, constraints, and intent of	Brainstorming: Ideas are somewhere aligned to problem but need explanation to make clear. Plan/Create/Build: The design and model is somewhat aligned with the	Brainstorming: Ideas are aligned to problem. Plan/Create/Build: The design and model is aligned with the criteria, constraints, and intent of the problem.	

	<p>the problem.</p> <p>Improve/Reflection: Student only explains one concept: either what would be kept the same or what would be changed. Also, does not provide evidence for response.</p>	<p>criteria, constraints, and intent of the problem.</p> <p>Improve/Reflection: Student explains what would be kept the same and what would be changed, but does not provide evidence for response.</p>	<p>Improve/Reflection: Student explains what would be kept the same and what would be changed. Provides evidence for response.</p>	
Collaboration	<p>Ignores and distracts others.</p> <p>Shows no understanding of project and has a negative attitude during work time.</p> <p>Argues with others and does not ask or answer any questions.</p>	<p>Listens respectfully and follows directions.</p> <p>Shows understanding of project and sometimes argues with others.</p> <p>Asks and answers questions.</p>	<p>Listens respectfully and engages in discussion.</p> <p>Shows understanding of project and has a positive attitude during work time. Never argues with others.</p> <p>Asks and answers questions and provides evidence to support answers.</p>	

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>