

Teach #	Target Audience/recommended course(s)
Teach Date: Next Gen Standards: (HS-PS2-3) (HS-PS2-2)	Title of Lesson: The Science of a Turn
<p>Main Idea of the Lesson: Through a hands-on activity, students will explore the science of a turn. Students will learn about the caster, camber, and toe of a car through a real-life experience.</p>	
<p>Video https://www.nsf.gov/news/special_reports/sos/turning.jsp https://www.cnet.com/roadshow/videos/car-tech-101-understanding-wheel-alignment/</p> <p>Graphic http://www.bridgestonetire.com/tread-and-trend/drivers-ed/tire-alignment</p> <p>Reading http://www.ozebiz.com.au/racetech/theory/align.html</p> <p><u>Florida State Standards</u> SC.912.N.1.2 SC.912.N.1.7 SC.912.N.2.1 SC.912.P.10.1 SC.912.P.12.2 SC.912.P.12.3</p>	

<p>Engagement: Estimated Time: 5-10 minutes</p> <p>Description of Activity:</p>		
<p>What the Teacher does:</p>	<p>What the Student does:</p>	<p>Possible questions to ask students- <i>think like a student and consider possible student responses</i></p>
<ol style="list-style-type: none"> 1. Show a video clip. 2. Ask probing questions. 3. Introduce vocabulary. 	<p>Observe the video, and then propose answers to the teacher's questions.</p>	<p>What is caster?</p> <p>What is camber?</p> <p>What is toe?</p> <p>How does this effect driving?</p> <p>Why do we need caster, camber, and toe?</p> <p>Is there science involved in turning? -explain</p> <p>Have you ever gotten your car aligned?</p>

Resources Needed: Internet Access, Projector

Safety Considerations: N/A

Exploration:

Estimated Time: 1-3 hours

Overview of the Activity:

What the teacher does:	What the student does:	Possible questions to ask students- <i>think like a student and consider possible student responses</i>
<ol style="list-style-type: none">1. Load students onto buses.2. Commute to Andretti Thrill Park.3. Unload students and direct them to their designated location.4. Monitor students if necessary.5. Answer questions.	<ol style="list-style-type: none">1. Follow teacher's directions for traveling to Andretti Thrill Park.2. Commute to Andretti's and follow instructions on where to be.3. Listen to informational speakers- Elaine Larsen and Kat Redner4. Use the information taught to optimize your time on the track.	<p>How is a go-kart different than a regular car?</p> <ul style="list-style-type: none">-caster-camber-toe <p>How will caster, camber, and toe affect my speed?</p> <p>How will the banking of the track affect my turns?</p> <p>How can I optimize my experience at Andretti Thrill Park?</p>

<p>Explanation: Estimated Time: 7-13 minutes</p> <p>Overview of Activity:</p>		
<p>What the teacher does:</p>	<p>What the student does:</p>	<p>Possible questions to ask students- <i>think like a student and consider possible student responses</i></p>
<ol style="list-style-type: none"> 1. Ask about the student's experience at Andretti's. 2. Explain to the students what occurred on the different tracks. 3. Label jet car, go kart, and truck on the whiteboard. 4. Compare the student's ideas for a "perfectly aligned" vehicle. 	<ol style="list-style-type: none"> 1. Participate in the discussion. 2. Listen to teacher. 3. Compare a jet car, go cart, and truck <ul style="list-style-type: none"> -caster -camber -toe 	<p>Why do we need caster, camber, and toe?</p> <p>How did your experience racing the go-karts help you understand the science of a turn?</p> <p>How is caster, camber, and toe different for vehicles with different purposes/uses?</p>

Material Needed: Whiteboard, markers

Safety Considerations: N/A

Elaboration: Estimated Time: 10-15 minutes Overview of Activity:		
What the teacher does:	What the student does:	Possible questions to ask students- <i>think like a student and consider possible student responses</i>
<ol style="list-style-type: none"> 1. Hand out informational poster. 2. Review poster. 	<ol style="list-style-type: none"> 1. Review poster and ask questions. 	<p>How does this help you visualize what you did at Andretti's?</p>

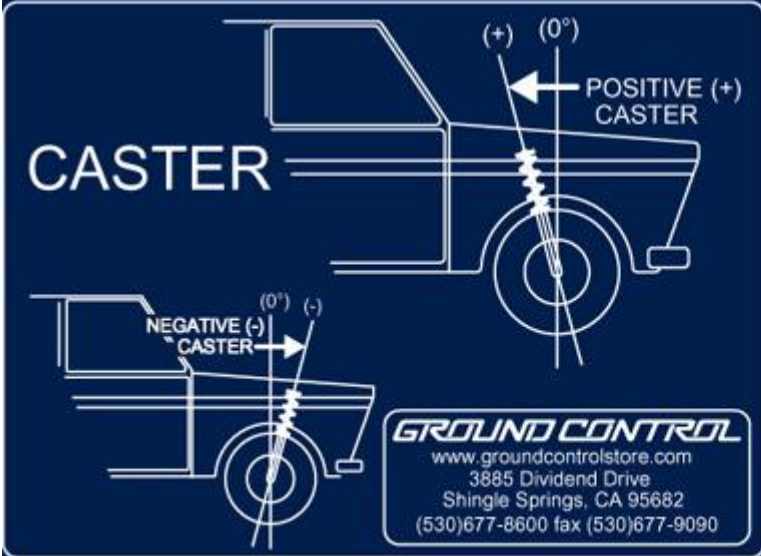
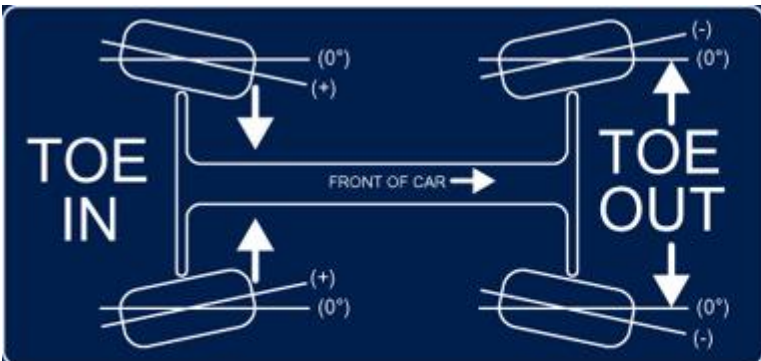
Materials Needed: STEM Poster

Safety Considerations: N/A

Evaluation: Estimated Time: 10 minutes Description of Activity:		
What the teacher does:	What the student does:	Possible questions to ask students- <i>think like a student and consider possible student responses</i>
1. Discuss the comparisons in the Explanation portion of the lesson.	1. Participate in the class discussion.	How is the jet car different from the go-kart? Are the 3 vehicles similar in any way?

Materials Needed: N/A

Safety Considerations: N/A



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