

Wednesday, March 20, 2019

Your Learning Goal: Students will be able to observe centripetal motion with the water bucket demo and creation of a water vortex. They will be able to explain most circular orbiting objects.

Spinning in circles- 41L + R

- Catalyst 41L: Think about a time you rode a roller coaster / watched one. What keeps the passengers in their seats when in a loop? What forces are at work here? Explain.



Homework:

Unit Test & Notebook Check
Week of April 1
Gravity HW Due Thur/Fri



Agenda:

1. Catalyst
2. Water Bucket Challenge
5. Water Vortex + Video
6. Reflection

Table of Contents

<u>Date</u>	<u>Assignment</u>	<u>Pg #</u>
2/19/19	Runner's Speed	34L + R
2/22/19	Velocity & Vectors	35 L + R
3/1/19	Forces Everywhere!	36 L + R
3/5/19	How high can I jump?	37 L + R
3/7/19	Rules of (Gravitational) Attraction	38 L + R
3/11/19	You Look Tense	39 L + R
3/13/19	Feel the tension	40 L + R
3/20/19	Spinning in Circles	41 L + R

3/20/19

Catalyst:

Think about a time you rode a roller coaster / watched one.

What keeps the passengers in their seats when in a loop? What forces are at work here? Explain.

Spinning in Circles

41L

41R

Catalyst 41 L

<https://www.youtube.com/watch?v=5VI4s6GADgI&frags=pl%2Cwn>

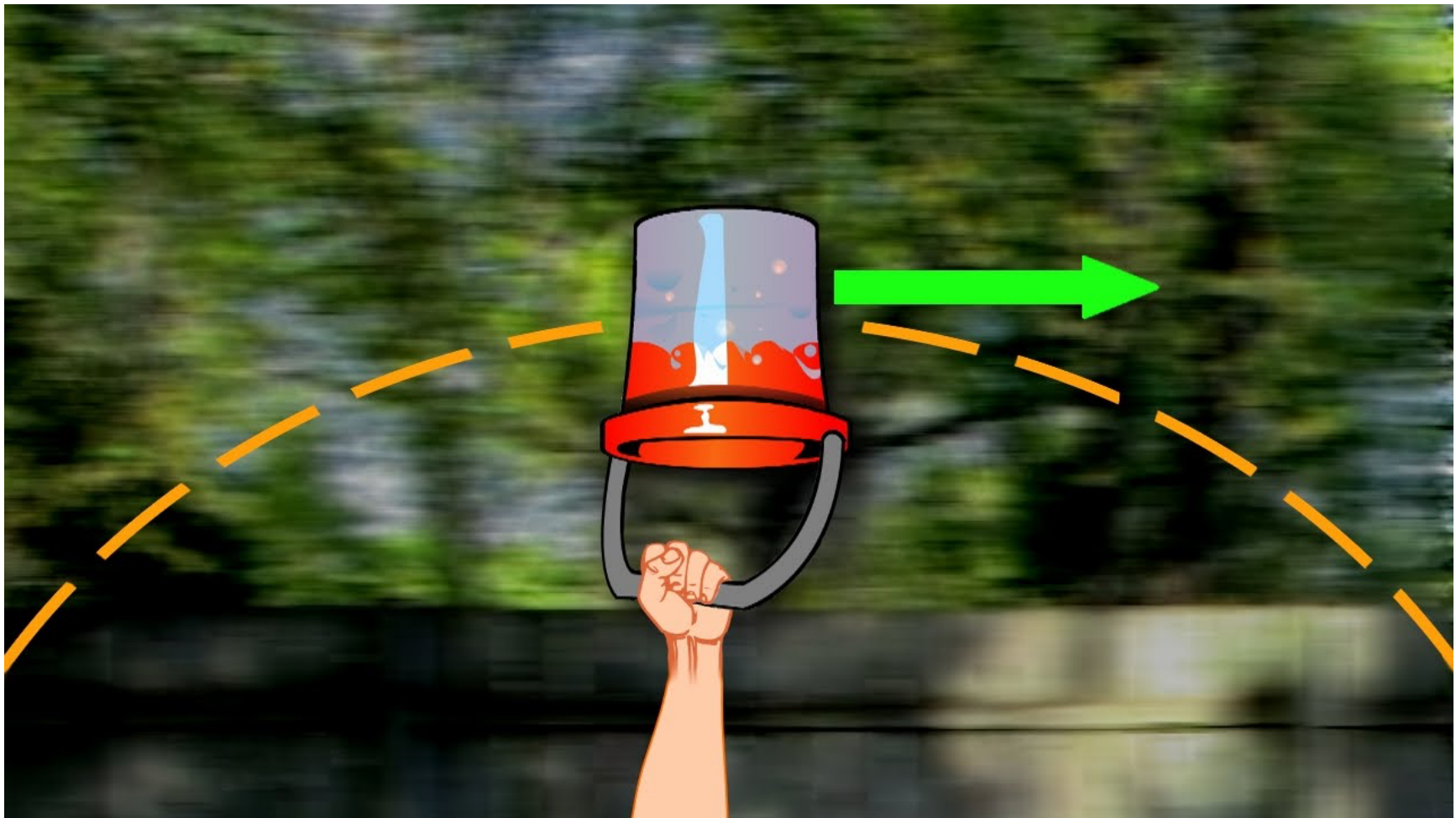
https://www.youtube.com/watch?v=zHpAifN_2Sw&frags=pl%2Cwn



Think about a time you rode a roller coaster / watched one.
What keeps the passengers in their seats when in a loop?
What forces are at work here? Explain.

Let's take a trip... to the courtyard

<https://www.youtube.com/watch?v=ZjqrX7wrpJc>



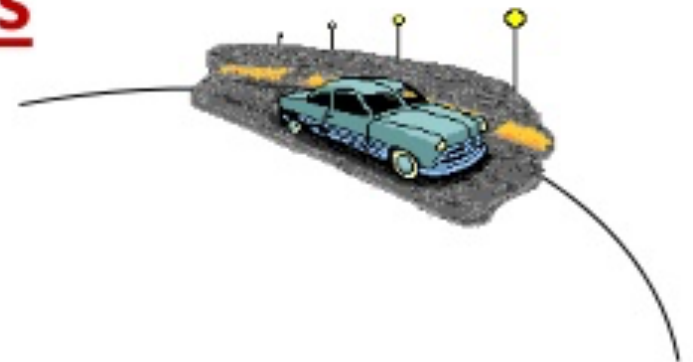
Shake it up!

<https://www.youtube.com/watch?v=TkYJHp9KOxk&frags=pl%2Cwn>





Centripetal forces Examples



1. Friction, as in the turning car example
2. Tension, as in a rock whirling around while attached to a string, or the tension in the chains on a swing at the park.

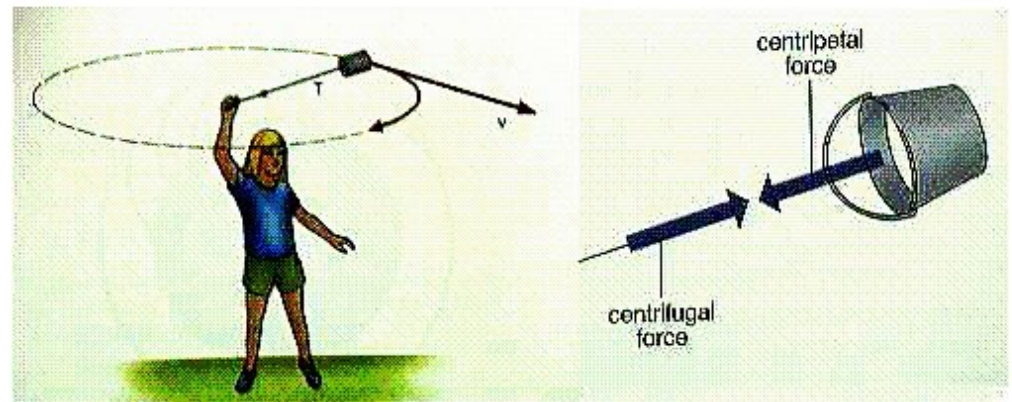
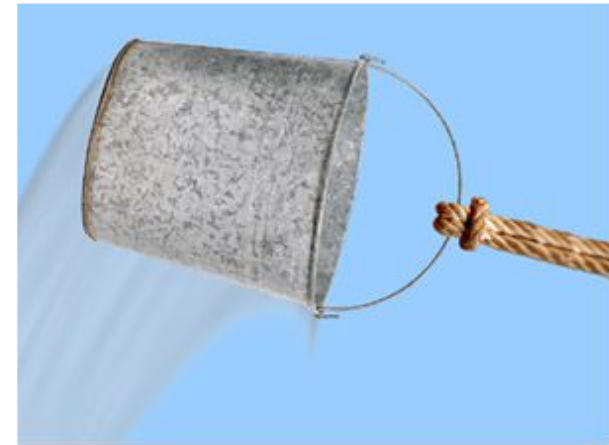


Gravity: The force of gravity between the Earth and sun keeps the Earth moving in a nearly circular orbit.



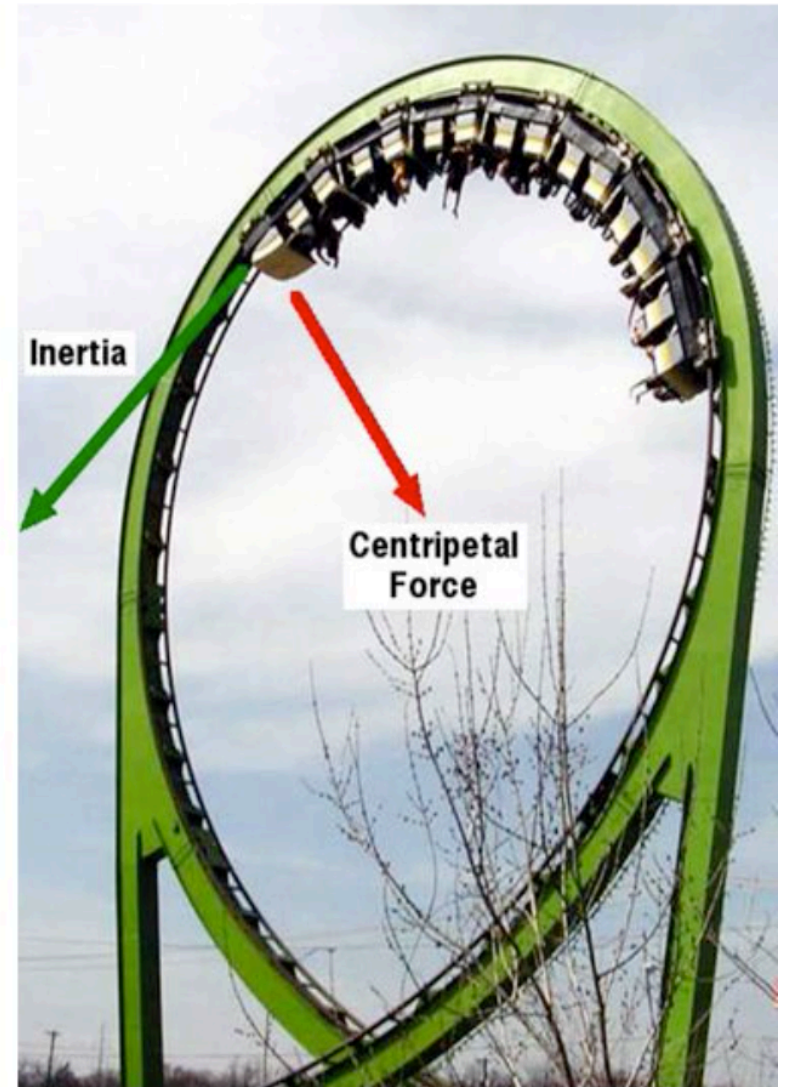
Spinning stuff- Centripetal Force

- Spinning a bucket of water over your head without spilling a drop, you are also applying a centripetal force. If you let go of the bucket, it will move in a straight line
- Centripetal force is always directed at the centre of an object.



Centripetal Force

- Any force that keeps an object moving in a circle
- This force points toward the center of the circle
- Without this force object would go flying off in a straight line
- Centripetal force keeps the planets in orbit



Centripetal Force

- Greater acceleration = greater centripetal force
- More mass requires more centripetal force to have the same circular speed as a less massive object.
- No matter the mass of an object, if it moves in a circle, its force and acceleration are directed to the center of the circle

Draw a simplified diagram on **41R**

$$F_c = m \times v^2 / r$$

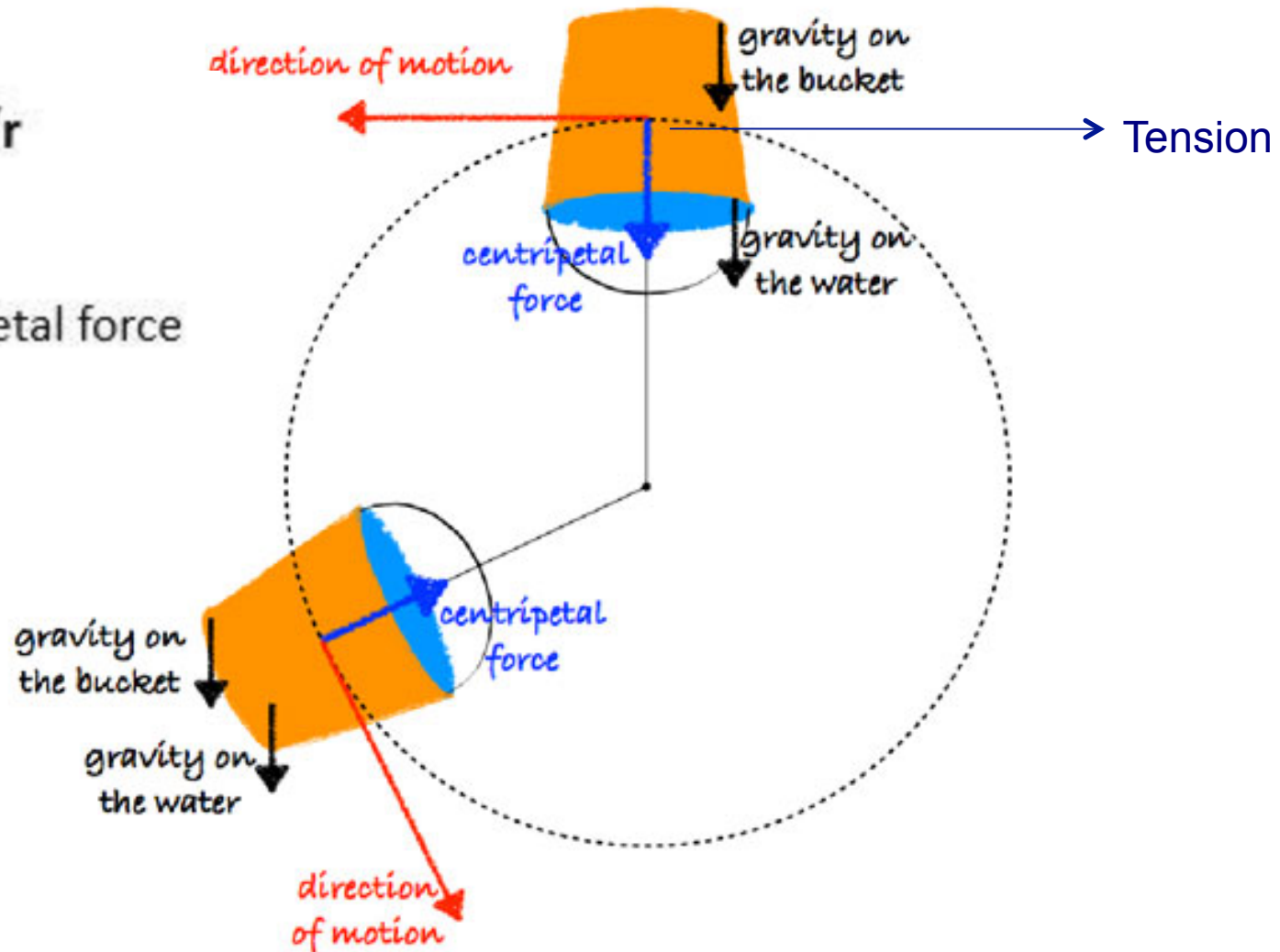
Where:

F_c = centripetal force

m = mass

v = velocity

r = radius



3/19/19

Spinning In Circles

Catalyst:

Think about a time you rode a roller coaster / watched one.

What keeps the passengers in their seats when in a loop? What forces are at work here? Explain.

REFLECTION:

Explain why the passengers don't fall out of their seats on a roller coaster ride or the bucket of water didn't spill on Ms. Salzburg. **You must use the term centripetal force and its definition in your response.**

41L

41R