

Beach Cruiser



10-Speed



Mountain Bike



Name: _____

The STEM Bike

GRADES 3-5

Explore/Elaborate

Describe how each bike would function and perform as a STEM Bike during a race. Think about size and specific features of each bike, such as the tires, tire tread, handlebars, and seat.

10-Speed Bike: _____

Mountain Bike: _____

Beach Cruiser: _____

Using the data collected, identify properties and materials that support a STEM Bike’s function and performance.

	Size/Shape	Materials	Tires: Size & Tread	Handlebars	Seat	Other Features
Beach Cruiser						
10-Speed Bike						
Mountain Bike						

Name: _____

Changing Gears

GRADES 3-5

Explore

	Diagram of Bike Gears	When Should This Gear Be Used And Why?
Gear 1		
Gear 3		
Gear 5		

Elaborate

	Trial 1		Trial 2		Trial 3	
	Distance	Time	Distance	Time	Distance	Time
Gear 1						
Gear 3						
Gear 5						

Name: _____

Changing Gears

GRADES 3-5

Evaluate

Draw a force diagram on the pedal of the bike to represent each gear.

Gear 1	Gear 3	Gear 5

Extend

	Speed Prediction	Distance	Time	Actual Speed
Gear 2				
Gear 4				

How accurate was your prediction? _____

Name: _____

Calculating Calories and Heart Rate

GRADES 3-5

Engage and Explore

	Partner 1	Partner 2
Resting Heart Rate (measured)		
Maximum Heart Rate (calculated)		
Heart Rate (15 seconds peddling)		
Heart Rate (30 seconds peddling)		
Heart Rate (45 seconds peddling)		
Heart Rate (60 seconds peddling)		
Heart Rate (75 seconds peddling)		
Heart Rate (90 seconds peddling)		

Explain/Elaborate

Weight in Kilograms = _____

Use the resting MET of 1.5 to calculate the total number of calories burned.

Time of Activity (hours) t	$C = (\text{MET} * \text{weight}) * t$	Calories Burned C
15 minutes = _____ hours		
30 minutes = _____ hours		
45 minutes = _____ hours		

Name: _____

Calculating Calories and Heart Rate

GRADES 3-5

Evaluate

Use the racing MET of 7.3 to calculate the total number of calories burned.

Time of Activity (hours) t	$C = (\text{MET} * \text{weight}) * t$	Calories Burned C
15 minutes = _____ hours		
30 minutes = _____ hours		
45 minutes = _____ hours		

Extend

	Peddling	Resting
Heart Rate (15 seconds)		
Heart Rate (30 seconds)		
Heart Rate (45 seconds)		

Name: _____

The Need for Speed

GRADES 3-5

Explore

Rider	Trial 1	Trail 2	Trial 3
Partner A			
Partner B			

Elaborate

Rider	Trial 1	Trail 2	Trial 3	Trail 4	Trial 5
Partner A					
Partner B					

Evaluate

Calculate to determine your answer.

	All Five Rides
Your Average Time	
Your Partner's Average Time	

Name: _____

Helmet Technology

GRADES 3-5

Elaborate

Brainstorm multiple designs.

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Select a single design

Draw in detail, label materials, and provide measurements.

Name: _____

Energy of the Ride

GRADES 3-5

Explore

Coasting/No Pedaling

Distance _____

Rider	Trial 1	Trial 2	Trial 3
Partner A			
Partner B			

Evaluate

Pedaling

Distance _____

Rider	Trial 1	Trial 2	Trial 3
Partner A			
Partner B			

Calculate your velocity from each section: $\text{Velocity} = \frac{s \text{ (displacement)}}{t \text{ (time)}}$

Which ride had more velocity and why?

Name: _____

Advancements in Bike Technology

GRADES 3-5

Evaluate

Diagram the STEM Bike

Measurements of the Bike

Observations (texture, shape, color, etc.)

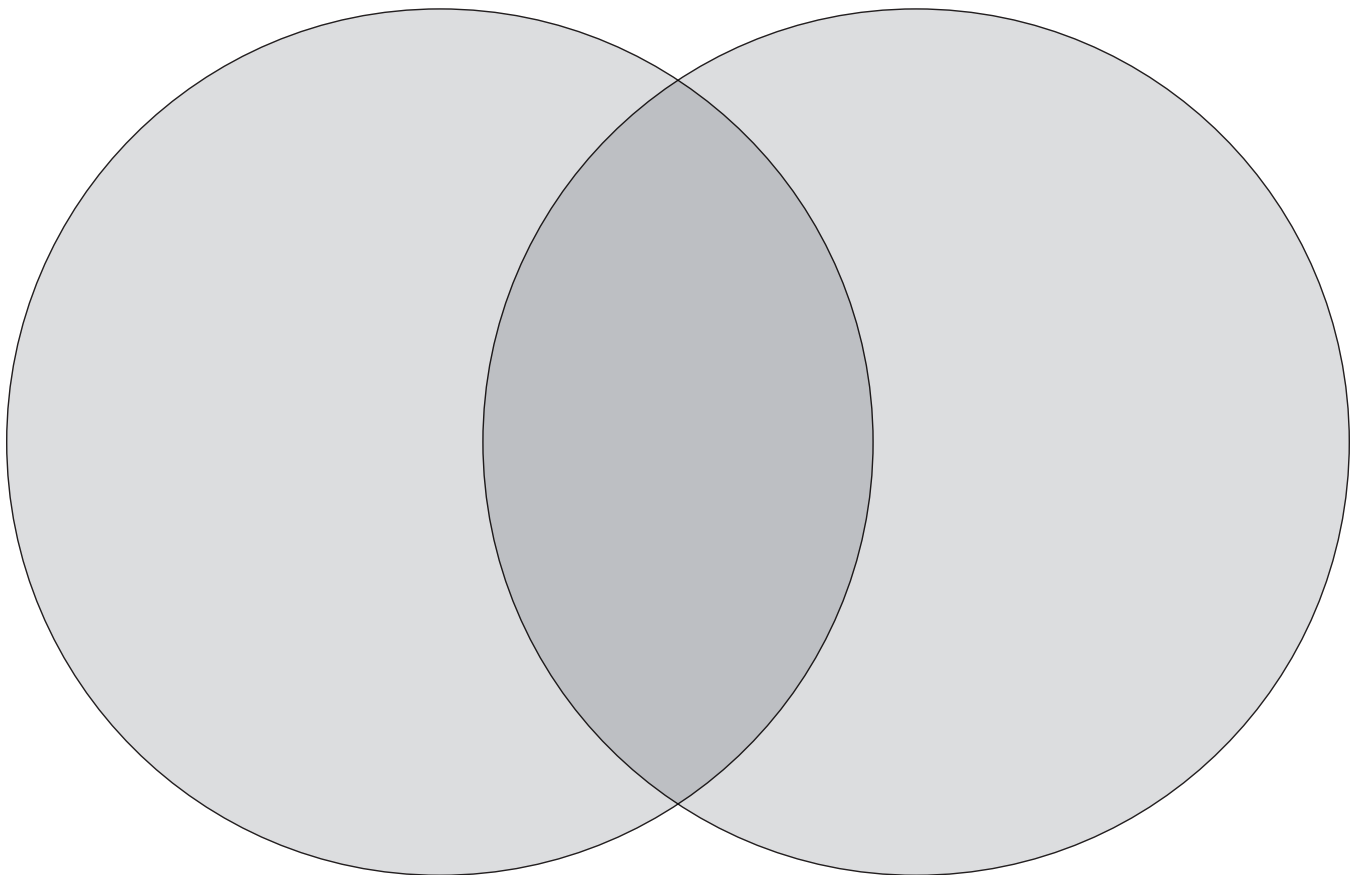
Name: _____

Advancements in Bike Technology

GRADES 3-5

Evaluate

What is the difference between an Observation and an Inference?

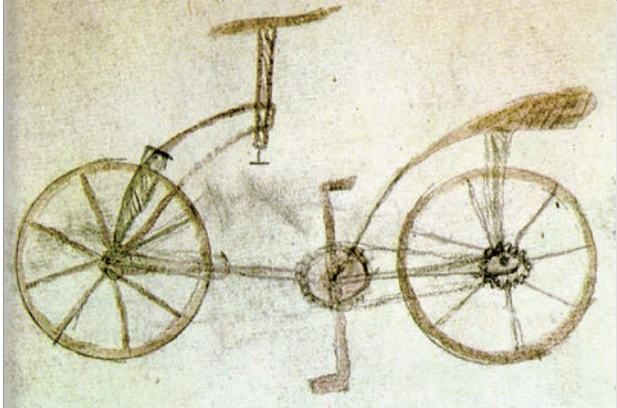
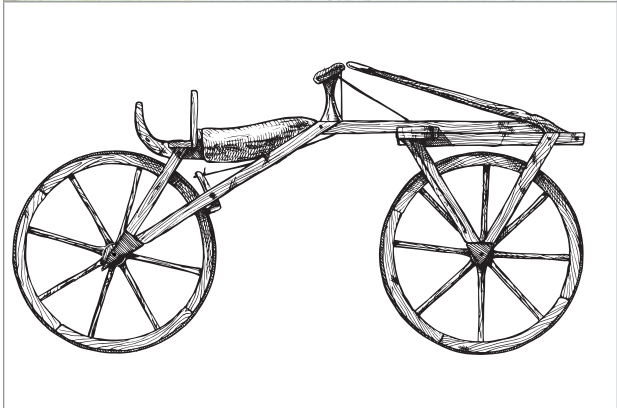
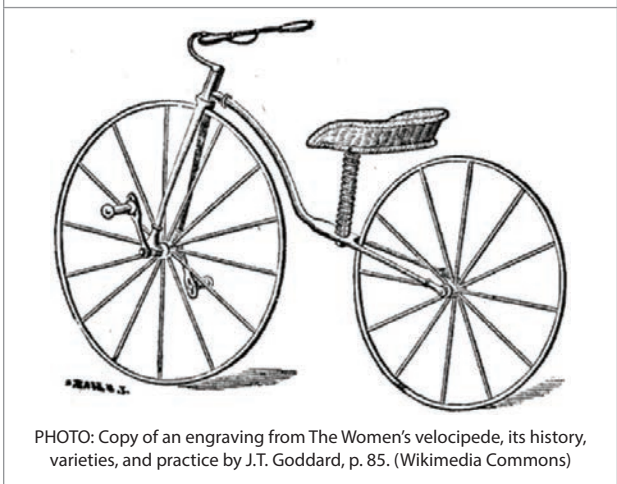


Name: _____

Advancements in Bike Technology

GRADES 3-5

Evaluate

Bike	Observations with Numbers	Observations with Words	Inference: Why was there a design change?
			
			
 <p data-bbox="227 1889 782 1933">PHOTO: Copy of an engraving from The Women's velocipede, its history, varieties, and practice by J.T. Goddard, p. 85. (Wikimedia Commons)</p>			

Name: _____

Advancements in Bike Technology

GRADES 3-5

Evaluate

Bike	Observations with Numbers	Observations with Words	Inference: Why was there a design change?
