




ALL LEVELS		NGSS Standards
Summary	 CER ✓	Basic Tutorial <ul style="list-style-type: none"> Determine how the sugar in the water affects the petal loss. Determine how the salt in the water affects the petal loss. Determine how the red dye in the water affects the redness of the petals
Summary	 CER ✓	Advanced Tutorial <ul style="list-style-type: none"> Determine how the size of the sled affects the total distance traveled from the end of the ramp. Determine how the height of the tower affects the total distance traveled from the end of the ramp. Determine how the roughness of the ramp affects the time to end of the ramp.

6 TH GRADE		NGSS Standards
Summary		Predation: Introduction <ul style="list-style-type: none"> Investigate how seal birthrate influences the maximum shark population. Investigate how shark birthrate influences the maximum seal population. Investigate how a starting seal population influences the length of the predation cycle. Investigate how a starting shark population influence the length of the predation cycle.

Summary



CER ✓

Density

MS-PS1-2

- Determine how the **type of liquid** affects the **density** of the liquid.
- Determine how the **shape** of the container affects the **density** of the liquid.
- Determine how the **amount** of liquid affects the **density** of the liquid.

7TH GRADE

NGSS Standards

Summary



Phase Change

MS-PS1-4

- Determine how the amount of **heat** affects the **boiling point** of water.
- Determine how the **size** of the container affects the **time** the water takes to boil.
- Determine how the **amount of ice** affects the **boiling point** of water.
- Determine how the **amount of ice** affects the **melting point** of ice.

Summary



Chemical Reactions

MS-PS1-2

MS-PS3-4

- Determine how the **substance added to vinegar** impacts the **temperature** change.
- Determine how the **amount of baking soda** impacts the **temperature** change.
- Determine how the **amount of vinegar** impacts the **temperature** change.

Summary



Cells: Animal - Function

MS-LS1-2

- The **Golgi body** is not receiving enough **protein**. Investigate how you can fix this problem.
- The cell is producing too many **ribosomes**. Investigate how you can decrease the production of ribosomes.
- The cell has too much **protein**. Investigate how you can reduce the amount of protein.

Summary

Cells: Animal - Energy & Storage

- The cell **cannot break down food**. Investigate how you can fix this problem.
- The cell is storing **too many nutrients**. Investigate how you can fix this problem.
- The cell is **low on energy**. Investigate how you can increase its energy.

Summary

Cells: Plant - Function

- The **Golgi body** is not receiving enough **protein**. Investigate how you can fix this problem.
- The cell is producing too many **ribosomes**. Investigate how you can decrease the production of ribosomes.
- The cell has too much **protein**. Investigate how you can reduce the amount of protein.

Summary

Cells: Plant - Energy & Storage

- The cell does not have enough **storage** space.
- The cell is not producing enough **food**. Investigate how you can fix this problem.
- The cell is **low on energy**. Investigate how you can increase its energy.

SummaryPlate Tectonics: Convergent Plates-
Introduction

- Determine how the **plate type** affects the **formation** type.
- Investigate how the **duration** of plate movement impacts the **formation heights** at the convergent boundary.
- Investigate how **plate size** impacts the **number of earthquakes** at the convergent boundary.

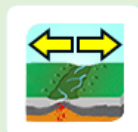
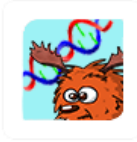
Summary

Plate Tectonics: Divergent Plates

- Investigate what affects the **formation** observed at the divergent boundary.
- Middle School: Investigate what affects the **age of crust**.

MS-LS3-2

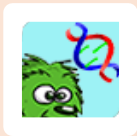
Genetics

[Summary](#)

- Determine how the Mother's F alleles impact the chance of producing the offspring with red fur.
- Determine how the Mother's L alleles impact the chance of producing the offspring with short fur.
- Determine how the Mother's H alleles impact the chance of producing the offspring with horns.

MS-LS4-4

Diversity of Traits

[Summary](#)

- Investigate how foliage influences the presence of red, short furred living in the environments.
- Investigate how fur color mutation influences the final number of green, short furred living in the environments.
- Investigate how a fur length mutation influences the presence of red, long furred living in the environments.
- Investigate how temperature influences the final number of green, long furred living in the environments.

MS-LS4-6

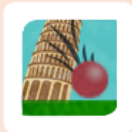
Natural Selection

[Summary](#)

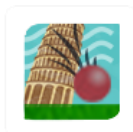
- Investigate the optimal amount of foliage for the green, long furred slinquettes' population.
- Investigate the optimal amount of foliage for the red, short, furred slinquettes' population.
- Investigate the optimal temperature for the green short furred slinquettes' population.
- Investigate the optimal temperature for the red, long furred slinquettes' population.

MS-PS2-2

Velocity: Free Fall

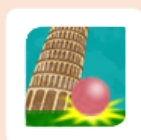
[Summary](#)

- Determine how the height of the drop affects the final speed of the ball.
- Determine how the height of the drop affects the time to drop.
- Determine how the mass of the ball affects the time to drop.

Summary

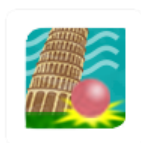
Velocity & Air Resistance

- Determine how the **height** of the drop affects the **velocity** of the ball before it hits the ground.
- Determine how the **mass** of the ball affects the **acceleration** before the ball hits the ground.
- Determine how the **volume** of the ball affects the **force** as the ball hits the ground.
- Determine how the **volume** of the ball affects the **time** before the ball hits the ground.

Summary

Energy: Free Fall

- Determine how the **height** of the drop affects the **kinetic energy** as the ball hits the ground.
- Middle School: Determine how the **height** of the drop affects the **potential energy** before the ball is dropped.

Summary

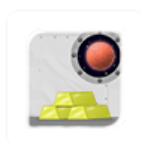
Energy & Air Resistance

- Determine how the **height** of the drop affects the **potential energy** before the ball is dropped.
- Determine how the **mass** of the ball affects the **mechanical energy** as the ball hits the ground.
- Determine how the **volume** of the ball affects the **thermal energy** of the system.
- Determine how the **volume** of the ball affects the **kinetic energy** as the ball hits the ground.

Summary

Gravity & Mass: Introduction

- Determine how the **planetary body** we are orbiting affects the **weight** of the gold.
- Determine how the **planetary body** we are orbiting affects the **mass** of the gold.
- Determine how the **amount** of gold affects the **weight** of the gold.

Summary

Gravity & Orbit Distance

- Determine how the **amount** of gold affects the **force of gravity** on gold.
- Middle School: Determine how the gold's **distance** from the planet's center affects the force of **gravity** on gold.

MS-PS2-1

Collisions: Introduction

[Summary](#)

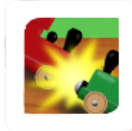


- Determine how the **mass** of the green ball affects the **final velocity** of the green ball.
- Determine how the **initial velocity** of the red ball affects the total final **momentum** to the right.
- Determine how the **mass** of the red ball affects the total final **momentum** to the right.

MS-PS2-1

Collisions: Inelastic (Trains)

[Summary](#)



- Determine how the initial **velocity** of the red train affects the total final **momentum** to the right.
- Determine how the initial **velocity** of the green train affects the total final **momentum** to the right.
- Determine how the **mass** of the red train affects the final **velocity** of the red train.

MS-PS2-2

Forces & Motion: Introduction

MS-PS2-4

[Summary](#)



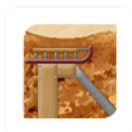
- Determine how the **mass** of the sled impacts the **force** of the sled on the spring.
- Determine how the **roughness** of the ramp impacts the **time** to end of the ramp.
- Determine how the **height** of the tower impacts the **velocity** of the sled.

MS-PS2-2

Forces & Motion: Different Planetary Bodies

MS-PS2-4

[Summary](#)



- Determine how the **gravity** of the planetary body impacts the **force** of the sled on the spring.
- Middle School: Determine how the **gravity** of the planetary body impacts the **time** to end of the ramp.

MS-ESS1-1

Lunar Phases

[Summary](#)



CER ✓

- Determine how the **position of the moon** impacts the **percent of the Moon facing the Sun**.
- Determine how the **location of the observer** impacts the **percent of the Moon lit up**.
- Determine how the **orbital speed of the moon** impacts the **duration of lunar orbit**.

Eclipses: Introduction

Summary



- Determine how the **phase of the Moon** affects the **possibility** of viewing a **lunar eclipse**
- Determine how the **phase of the Moon** affects the **possibility** of viewing a **solar eclipse**
- Determine if the **orbital tilt of the moon** impacts the average number of **lunar eclipses**.
- Determine how the **time of year** impacts the average number of **solar eclipses**.

Seasons: Introduction

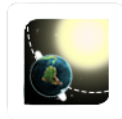
Summary



- Determine how the **tilt of the Earth** affects the average **temperature**.
- Determine how the **location of Earth in orbit** affects the **distance** of Earth from the Sun.
- Determine how the **location of the observer** on Earth affects the **angle of sunlight**.

Seasons: Earth has NO Tilt! Introduction

Summary



- If the Earth has no tilt, determine how the **location of Earth in orbit** affects the **average temperature**.
- If the Earth has no tilt, determine how the **location of Earth in orbit** affects the **distance** of Earth from the Sun.
- If the Earth has no tilt, determine how the **location of the observer** affects the **angle of sunlight**.

Waves on a String: Introduction

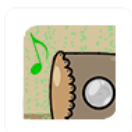
Summary



- Determine how the **tension** of the string impacts the **wave frequency**.
- Determine how the **length** of the string impacts the **wave speed**.
- Determine how the **strength** of the strum impacts the **loudness** of the sound.

Waves in a Drum: Introduction

Summary



- Determine how the substance in the drum (**medium**) influences the **wave speed**.
- Determine how the mallet **position** influences the **loudness** of the sound produced.
- Determine how the mallet **speed** influences the **pitch** of the sound produced.

Summary



Waves & Thermal Energy

MS-PS1-4

MS-PS4-2

- Determine how the **temperature** in the drum influences the **wave speed**.
- Determine how the **temperature** in the drum influences the **loudness** of the sound produced.
- Determine how the **temperature** in the drum influences the **pitch** of the sound produced.