Wyoming
DEPARTMENT OF EDUCATION

PAWS
Science
Grade 8

Released Items With Data

Physical Systems

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Science Released Items with Data
Introduction Page / Data Definitions

This Released Items with Data document provides a subset of items from the 2015 administration of the PAWS test. The data for an item is on the page that follows that item. The following provides definitions for the data fields on the data page.

Item Information

Title: Title of the passage/stimulus the item belongs to

Domain: The reporting category of the state content standards

Benchmark: State content standard

Context: Main idea from subject matter

Item Code: Identification code assigned to the item

Admin: The year an item is administered

Item Type: The mode in which a student responds (MC means multiple-choice)

Correct Answer: The option letter (A, B, C, or D) that corresponds to the correct answer

Item Dok: The item's Depth of Knowledge designation, also called Cognitive Complexity;
1 - Recall and reproduction
2 - Skills and concepts
3 - Strategic and extended thinking

Total N-count: Number of students counted as taking the test in which the item appears during the listed administration (Includes item omissions)

Pvalue/Mean Score: For a multiple-choice item, the percent of students choosing the correct answer

Score Analysis

MC Row: Answer options available for students to choose from (including those who do not choose any option); an asterisk designates the correct answer

%Choosing Row: Percent of students choosing an option (or omitting)

Item Notes: Area where user can make notes

Observing Changes

Ms. Brock's class is studying both chemical and physical changes that occur every day. Ms. Brock sets up eight different test stations for her students to study these types of changes. The stations show how these changes relate to the behavior and properties of molecules.

The table describes the different test stations.

Test Stations

Station #	Station Description
1	A rusted nail sits in a beaker of salt water.
2	A piece of paper has been cut into four smaller pieces.
3	Two clear liquids combine in a test tube to form a white solid.
4	Ice melts in a cup with a thermometer.
5	Bubbles appear as a piece of metal sits in a beaker of clear liquid.
6	A paper clip completes a circuit to ring a bell.
7	A nail has been hammered into a piece of wood.
8	A piece of limestone dissolves in a beaker of acid.

00 **The partial table of test stations shows Station 4.**

Test Stations

Station #	Station Description
4	Ice melts in a cup with a thermometer.

Which statement describes the ice cube melting at Station 4?

A) Density changes cause a change in state.

B) Temperature changes cause a change in state.

C) Volume changes cause a new substance to form.

D) Pressure changes cause a new substance to form.

Item Information	
Title:	Observing Changes
Domain:	Physical Systems
Benchmark:	SC8.1.10 The Structure and Properties of Matter: Students identify characteristic properties of matter such as density, solubility, and boiling point and understand that elements are the basic components of matter.
Context:	D Properties and Changes
Item Code:	VH128915

Admin:	Item Type:	Correct Answer:	Item Dok:	Total N-count:	Pvalue/Mean Score:
Spring 2015	MC	B	2	773	0.765

Score Analysis					
MC	**A**	**B***	**C**	**D**	**Omit**
%Choosing	9.444	76.455	8.926	5.045	0.129

Item Notes

00 **The partial table of test stations shows Station 5.**

Test Stations

Station #	Station Description
5	Bubbles appear as a piece of metal sits in a beaker of clear liquid.

Which statement describes the molecules in the bubbles observed at Station 5?

A) The molecules expand in size.

B) The molecules vibrate in place.

C) The molecules are moving apart.

D) The molecules are the result of phase change.

Item Information	
Title:	Observing Changes
Domain:	Physical Systems
Benchmark:	SC8.1.10 The Structure and Properties of Matter: Students identify characteristic properties of matter such as density, solubility, and boiling point and understand that elements are the basic components of matter.
Context:	D Properties and Changes
Item Code:	VH128924

Admin:	Item Type:	Correct Answer:	Item Dok:	Total N-count:	Pvalue/Mean Score:
Spring 2015	MC	C	2	671	0.362

Score Analysis					
MC	**A**	**B**	**C***	**D**	**Omit**
%Choosing	20.417	16.393	36.215	26.975	0

Item Notes

00 **Which station <u>best</u> models the effect seawater could have on ships in the ocean?**

A) Station 1

B) Station 3

C) Station 5

D) Station 8

Item Information	
Title:	Observing Changes
Domain:	Physical Systems
Benchmark:	SC8.1.11 Physical and Chemical Changes in Matter: Students evaluate chemical and physical changes, recognizing that chemical change forms compounds with different properties and that physical change alters the appearance but not the composition of a substance.
Context:	D Properties and Changes
Item Code:	VH128959

Admin:	Item Type:	Correct Answer:	Item Dok:	Total N-count:	Pvalue/Mean Score:
Spring 2015	MC	A	3	671	0.741

Score Analysis					
MC	**A***	**B**	**C**	**D**	**Omit**
%Choosing	74.069	8.495	12.519	4.918	0

Item Notes

00 **The partial table of test stations shows Station 2.**

Test Stations

Station #	Station Description
2	A piece of paper has been cut into four smaller pieces.

Which of these <u>best</u> summarizes the changes seen at Station 2?

A) Physical change; the molecules in the substance break down

B) Chemical change; the molecules in the substance break down

C) Physical change; the properties of the substance stay the same

D) Chemical change; the properties of the substance stay the same

Item Information	
Title:	Observing Changes
Domain:	Physical Systems
Benchmark:	SC8.1.11 Physical and Chemical Changes in Matter: Students evaluate chemical and physical changes, recognizing that chemical change forms compounds with different properties and that physical change alters the appearance but not the composition of a substance.
Context:	D Properties and Changes
Item Code:	VH128967

Admin:	Item Type:	Correct Answer:	Item Dok:	Total N-count:	Pvalue/Mean Score:
Spring 2015	MC	C	2	671	0.535

Score Analysis					
MC	**A**	**B**	**C***	**D**	**Omit**
%Choosing	37.109	6.706	53.502	2.683	0

Item Notes

00 **The students want to calculate the forces acting on the block at Station 7. The mass of the block is 2.0 kilograms (kg). Force is determined by multiplying mass times acceleration (*F* = *ma*). What is the net force on the block at Station 7 when the nail is <u>not</u> in motion?**

A) 0.0 newtons

B) 2.0 newtons

C) 9.8 newtons

D) 19.6 newtons

Item Information	
Title:	Observing Changes
Domain:	Physical Systems
Benchmark:	SC8.1.14 Effects of Motions and Forces: Students describe motion of an object by position, direction, and speed, and identify the effects of force and inertia on an object.
Context:	F Forces and Motion
Item Code:	VH128955

Admin:	Item Type:	Correct Answer:	Item Dok:	Total N-count:	Pvalue/Mean Score:
Spring 2015	MC	A	2	773	0.515

Score Analysis					
MC	**A***	**B**	**C**	**D**	**Omit**
%Choosing	51.488	25.356	15.912	6.986	0.259

Item Notes

Nutria

Science students researched information about animals called nutria. The students discovered that nutria are large, semiaquatic rodents. Then the students placed the physical characteristics of nutria in the chart shown.

Physical Characteristics of Nutria

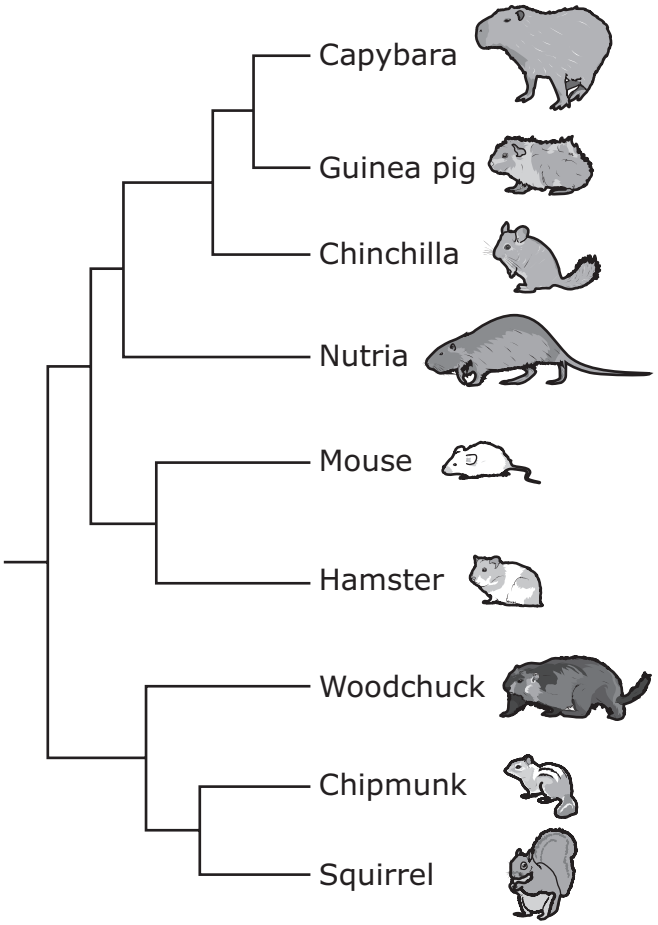
- Weigh between 5–7 kilograms
- Thick fur
- Long, thin tails
- Webbed feet
- Clawed toes
- Large front teeth used for gnawing

Nutria are herbivores that eat many types of aquatic plants. They build their nests, called burrows, by carving out areas along the banks of a body of water.

Nutria in Burrow

Nutria have many characteristics that are similar to other rodents. The evolutionary relationship among rodents is shown in the phylogenetic tree.

Evolutionary Relationship Among Rodents



00 **Nutria live in burrows along rivers. Which energy transformation occurs as water flows past these burrows?**

A) Kinetic energy is transformed into sound energy.

B) Sound energy is transformed into thermal energy.

C) Chemical energy is transformed into kinetic energy.

D) Thermal energy is transformed into chemical energy.

Item Information	
Title:	Nutria
Domain:	Physical Systems
Benchmark:	SC8.1.13 The Conservation of Matter and Energy: Students identify supporting evidence to explain conservation of matter and energy, indicating that matter or energy cannot be created or destroyed but is transferred from one object to another.
Context:	E Energy Types
Item Code:	VH103017

Admin:	Item Type:	Correct Answer:	Item Dok:	Total N-count:	Pvalue/Mean Score:
Spring 2015	MC	A	2	674	0.412

Score Analysis					
MC	**A***	**B**	**C**	**D**	**Omit**
%Choosing	41.246	17.359	25.964	15.43	0

Item Notes

Arctic Fox Adaptations

The Arctic fox can survive in some of the most extreme cold climates. It has thick fur and a round, compact body designed to minimize exposure to cold air.

A team of scientists traveled to Alaska to study the Arctic fox and better understand the connection between behavior and adaptation. The scientists recorded the Arctic fox coat color over time. The coat turns brown in the summer that camouflages with the tundra and turns white in the winter that camouflages with the snow. The pictures show the Arctic fox in both seasons.

Summer Coat

© Josef Friedhuber/iStockphoto #18462345

Winter Coat

© John Pitcher/iStockphoto #4117276

The scientists also observed how Arctic foxes hunt. The fox locates its prey beneath the snow using its very sensitive hearing. Its wide, front-facing ears listen intently for the slightest sound. When the Arctic fox hears its prey, it leaps into the air and breaks through the snow, crashing down onto its prey underneath, as shown.

Leaping for Prey

© Gary Schultz/Alaskastock.com

00 **Scientists want to determine the force of the Arctic fox as it leaps into the snow to catch its prey. What type of data will the scientists need in order to calculate this force?**

A) Time and distance

B) Gravity and height

C) Mass and acceleration

D) Displacement and weight

Item Information	
Title:	Arctic Fox Adaptations
Domain:	Physical Systems
Benchmark:	SC8.1.14 Effects of Motions and Forces: Students describe motion of an object by position, direction, and speed, and identify the effects of force and inertia on an object.
Context:	F Forces and Motion
Item Code:	VF671343

Admin:	Item Type:	Correct Answer:	Item Dok:	Total N-count:	Pvalue/Mean Score:
Spring 2014	MC	C	2	671	0.569

Score Analysis					
MC	**A**	**B**	**C***	**D**	**Omit**
%Choosing	9.836	17.735	56.93	15.499	0

Item Notes

00 **Which energy changes can be observed in a glacier that is moving slowly down a mountain?**

A) Kinetic energy changes into radiant energy.

B) Radiant energy changes into kinetic energy.

C) Potential energy changes into kinetic energy.

D) Thermal energy changes into radiant energy.

Item Information	
Title:	Glaciers Study
Domain:	Physical Systems
Benchmark:	SC8.1.13 The Conservation of Matter and Energy: Students identify supporting evidence to explain conservation of matter and energy, indicating that matter or energy cannot be created or destroyed but is transferred from one object to another.
Context:	E Energy Types
Item Code:	VF407164

Admin:	Item Type:	Correct Answer:	Item Dok:	Total N-count:	Pvalue/Mean Score:
Spring 2013	MC	C	2	658	0.421

Score Analysis					
MC	**A**	**B**	**C***	**D**	**Omit**
%Choosing	17.933	17.325	42.097	22.492	0.152

Dif Summary	
Group	**Dif Category**
Gender	A
Hispanic	
Native American	
Asian	

Item Notes

00 Why is melting of glacial ice considered a physical change?

A) The number of atoms in each water molecule changes.

B) The types of atoms in each water molecule change.

C) The water molecules react with molecules in the air.

D) The water molecules experience a change of state.

Item Information	
Title:	Glaciers Study
Domain:	Physical Systems
Benchmark:	SC8.1.11 Physical and Chemical Changes in Matter: Students evaluate chemical and physical changes, recognizing that chemical change forms compounds with different properties and that physical change alters the appearance but not the composition of a substance.
Context:	D Properties and Changes
Item Code:	VF407169

Admin:	Item Type:	Correct Answer:	Item Dok:	Total N-count:	Pvalue/Mean Score:
Spring 2013	MC	D	2	658	0.552

Score Analysis					
MC	**A**	**B**	**C**	**D***	**Omit**
%Choosing	16.413	9.878	18.085	55.167	0.456

Dif Summary	
Group	**Dif Category**
Gender	A
Hispanic	
Native American	
Asian	

Item Notes