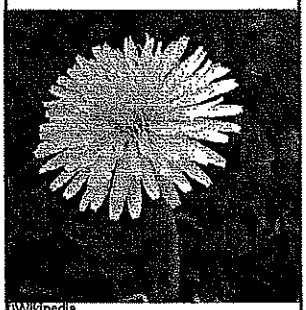
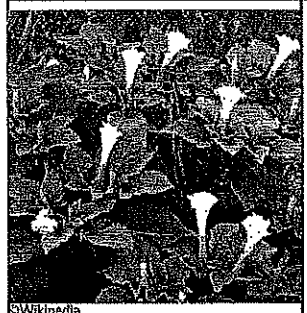
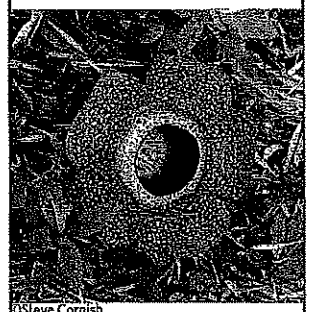
MS, LS1-4

Flower Seeking Pollinator DATA SHEET

Name: _____ Date: _____

Flower Traits		Number of Pollinator Visits					
		Butterfly	Bat	Bird	Bee	Moth	Fly
 ©Jane Nearing	**Flower 1** • No scent • Sweet nectar at base of large, long tube-shaped flower • No place for bird to rest while feeding • Flower points down • Blooms during day	5	0	28	0	0	2
 ©Wikipedia	**Flower 2** • Sweet, fragrant smell • Sturdy petal platform • Bulls-eye design in center of flower, visible only under UV light • Blooms during the day	0	0	0	65	0	30
 ©Wikipedia	**Flower 3** • Large white tube-shaped flower • Sweet, fragrant smell • Blooms at night	7	11	0	0	25	0
 ©Steve Cornish	**Flower 4** • Putrid odor, like rotting meat, carrion, dung, sap or blood • Flower is low to the ground • Flower blooms during the day	0	5	0	0	18	42

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Flower Traits		Number of Pollinator Visits					
		Butterfly	Bat	Bird	Bee	Moth	Fly
 ©Pixabay	**Flower 5** • No smell • Many small flowers • Brightly colored • Small, long tube-shaped flowers	55	0	0	14	3	0
 ©Dcoetzee	**Flower 6** • Sturdy petal platform • Bulls-eye design in center of flower, visible only under UV light • Blooms during the day	0	0	0	44	0	8
 ©Ken Bosma	**Flower 7** • Large white flower • Strong, musky smell • Blooms at night • Sturdy petal platform	0	19	0	6	12	0

Part One: Pollinator Observations

1. Who is your pollinator? _____

2. What number flower did your pollinator visit the most? _____

3. What are 3 flower traits that you think attract your pollinator? Use this sentence starter:

"_____ are attracted to flowers that are..."
(pollinator)

1. _____

2. _____

3. _____

Flower Seeking Pollinator

CONSTRUCTING EXPLANATIONS

Name: _____ Date: _____

Part Two: Pollinator Profiles

Using the information you learned in your Pollinator Profile **and** the Pollinator Observations, what are 3 flower traits that you think attract your pollinator? These may be slightly different from the ones you predicted in Part One. What evidence do you have that supports this idea?

	Flower Trait	**Evidence** *State scientific data to support your claim*
1.		
2.		
3.		

Part Three: An Imaginary Garden

Observe the variety of flowers in our imaginary garden. Using the information you learned in your Pollinator Profile **and** the Pollinator Observations, find one flower that you think would attract your pollinator.

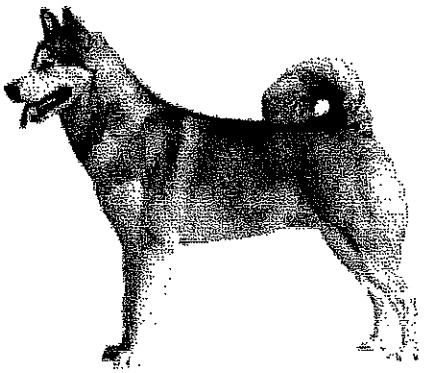
Circle which flower you think attracts your pollinator: **A B C D E F G H**

Write a sentence below that explains why that flower is most attractive to your pollinator.

Name: _____ Date: _____ P: MS.LS1-5

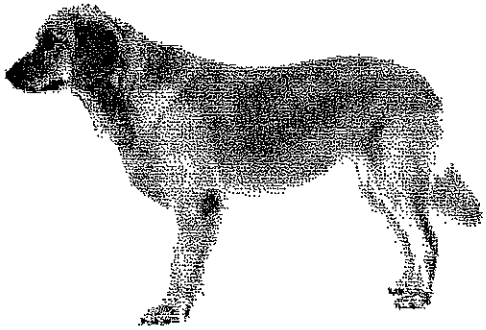
ENVIRONMENTAL VS. GENETICS FACTORS CER PROMPTS

Carlos just learned that all dogs belong to the same species. "But that's impossible," he shouted. "They all look so different!"

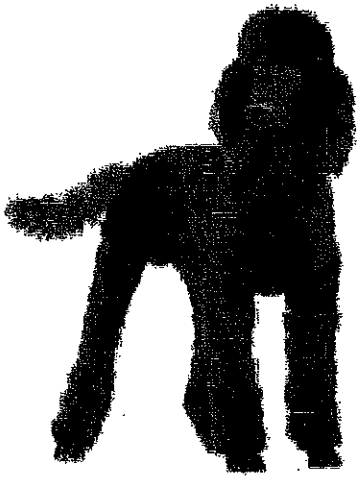


Alaskan Malamute

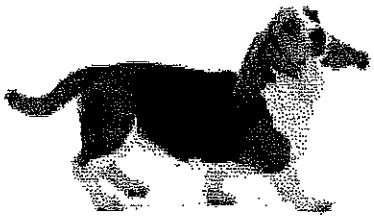
Chihuahua



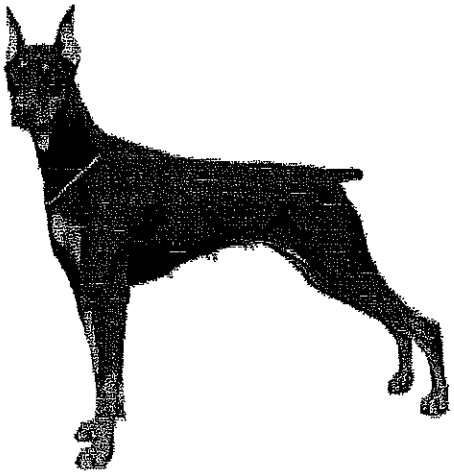
Golden Retriever



Poodle



Basset Hound



Doberman

Take a look at the dogs on this page, and then use detailed observations about the dogs to answer the question:
Are the differences between dog breeds (in the same species) caused by environmental or genetic factors?

The Dazzling Diversity of Dogs: How do dogs look so different but are essentially the same?

Every breed of dog is a member of exactly the same species—*Canis lupus familiaris*—regardless of its coat, shape or size. Dogs are a subspecies of wolves. While some variation between breeds has occurred naturally, most of the very obvious differences are the direct result of human breeding. Many dogs are bred for their aesthetic qualities but in the past there were more practical motivations behind human intervention in the gene pool, such as hunting.

One possible reason dogs are so easily adaptable is because changing their genetic code is relatively simple compared to many other species. In human genes, for example, most characteristics are governed by a complex network of genes, which work in combination to display certain outcomes. But with dogs, many quite drastic changes, such as fur type and ear shape, are controlled by a single genetic variation. In fact, a huge research project called CanMap determined that every single biological difference affecting dogs' appearance is controlled by one of around 50 gene variations. This simplicity is partly a result of the human activity which has tinkered with canine biology for thousands of years, and has therefore picked out the characteristics most easily changed by simple genes.

Read more:
http://www.dailymail.co.uk/sciencetech/article-2588177/The-family-tree-DOGS-From-tiny-chihuahuas-great-danes-Infographic-reveals-single-breed-related.html#ixzz

3sRsQJD4Z

Write a clear claim, provide supporting evidence from the images and from information you learned in class, and include reasoning that shows how your evidence supports your claim. Use vocabulary that you have learned in science class.

CLAIM: The differences between dog breeds in the same species are caused by **genetic** factors.
EVIDENCE:
REASONING

A group of students investigated the question: *Are the differences observed between plants grown in the sun and in the dark caused by environmental or genetic factors?* The students conducted an experiment where they put three types of plants in the light and in the dark and observed how they grew. Their observations are shown in the data table below.

Type of Grass	In the Light	In the Dark
Wheat	Tall, think green blades of grass	Tall and thick. Yellow in color.
Rye Grass	Blades of grass that are thinner than the wheat grass. Dark green in color.	Thin grass. Yellowish-green in color.
Alfalfa	White stems with two small round green leaves on top. Stems are a little curly.	White stems with two small round leaves on top. Stems are curly. Leaves are light yellow in color.

Select "environmental" or "genetic" in your claim, provide supporting evidence from the data table above, and include reasoning that shows how your evidence supports your claim. Use vocabulary that you have learned in science class.

CLAIM: The differences between the plants grown in the light and the dark are caused by **environmental/genetic** factors.
EVIDENCE:

REASONING

Name_____

MS.LS2-1
MS.LS2-4

DATA Nugget

Won't you be my urchin?

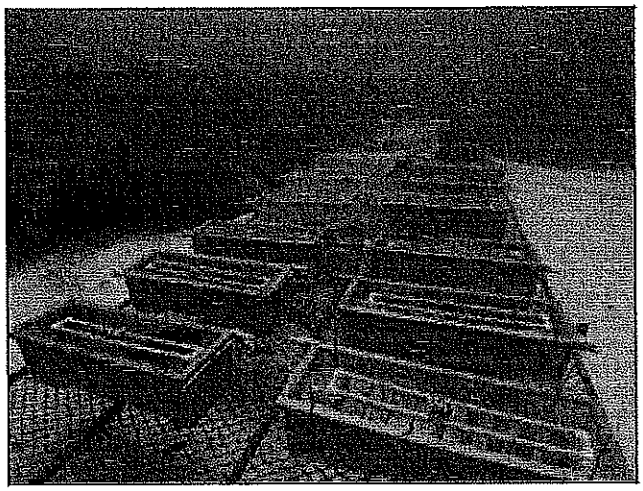
Featured scientist: Sarah W. Davies from University of Texas at Austin

Research Background:

Imagine you are snorkeling on a coral reef where you can see many species living together. Some animals, like sharks, are predators that eat other animals. Other species, like anemones and the fish that live in them, are mutualists and protect each other from predators. There are also herbivores, like **urchins**, that eat plants and algae on the reef. All of these species, and many more, need the coral reef to survive.

Corals are the animals that build coral reefs. They are very sensitive and can be hurt by human activity, like boating and pollution. Corals reef ecosystems are also in danger from warming waters due to climate change. Sadly, today many coral reefs around the world are dying because the places they grow are changing. Sarah is a marine biologist who is determined to figure out ways to save coral reefs. Sarah wants to understand how to help the dying corals so they can keep building the important and diverse coral reef habitats.

Corals compete with large types of **algae**, like seaweed, for space to grow on the reef. Corals are picky and only like to live in certain places. If there is too much algae, corals will have no place to attach and grow. Sea urchins are important herbivores and one of the species that like to eat algae. Sarah thought that when urchins are present on the reef, corals will have less competition from algae for space, and thus more room to grow. Maybe adding urchins to a coral reef is a way to help corals!



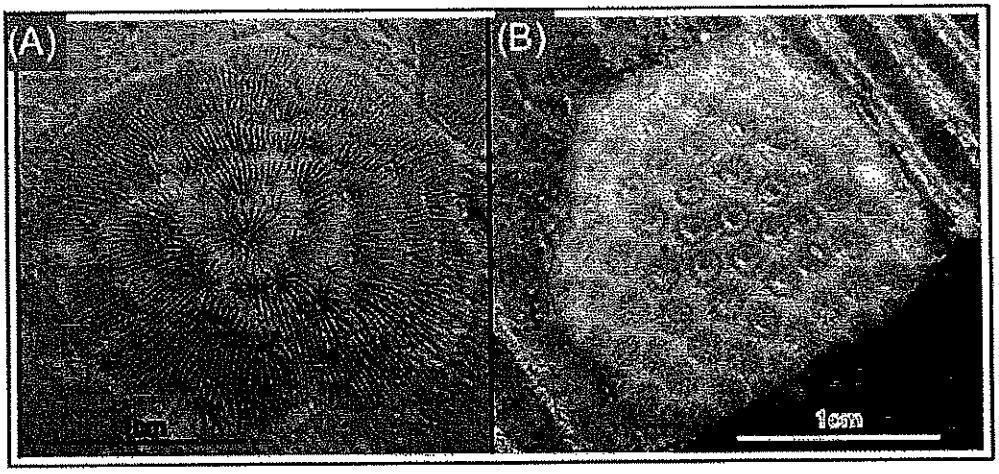
Experimental setup with tiles in bins. Some bins have sea urchins and some do not.

Scientist Sarah scuba diving on the coral reef for fieldwork

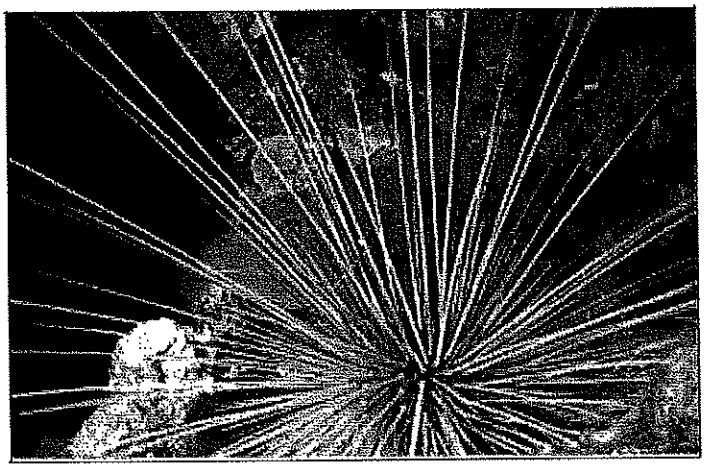
To test her idea Sarah set up an experiment. She set 8 bins out on the reef. Into half of the bins, Sarah added urchins. Into the other half she left without urchins as a control. Sarah put tiles into all of the bins. Tiles gave an empty space for coral and algae to compete and grow. After a few months, Sarah looked at the tiles. She counted how many corals were growing on each tile. Sarah predicted that more corals would grow on the tiles in bins with sea urchins compared to the control bins with no sea urchins.

Scientific Question: How does the presence of urchins affect corals?

What is the hypothesis? Find the hypothesis in the Research Background and underline it. A hypothesis is a proposed explanation for an observation, which can then be tested with experimentation or other types of studies.



(A) Coral species *Agaricia* juvenile on experimental tile.
(B) Coral species *Porites* juvenile on experimental tile.



The vegetarian sea urchin *Diadema antillarum.*

Name_____

Draw a diagram for the coral reef ecosystem:

1. Include **corals, urchins, and algae** in your diagram. Write out name of each species and put a box around it.

2. Add arrows to connect the boxes. Arrows represent the interactions between the species in the ecosystem. For example, you can use arrows to show who eats whom, or to show competition between different species. Use the direction of the arrow to show the direction of energy flow or other relationships.

3. Once you have drawn your arrows, label them with the type of interaction. For example, label an arrow with the words "eaten by" if the arrow connects a species to the species that consumes it.

Name_____

Scientific Data:

Complete the table and use the data below to answer the scientific question:

Treatment in the bin	Bin #	Number of corals on tile
Sea urchins present	1	8
Sea urchins present	2	12
Sea urchins present	3	10
Sea urchins present	4	25
No sea urchins	5	1
No sea urchins	6	3
No sea urchins	7	6
No sea urchins	8	11
Average number of corals on tile when urchins present		
Average number of corals on tile when there are no sea urchins		

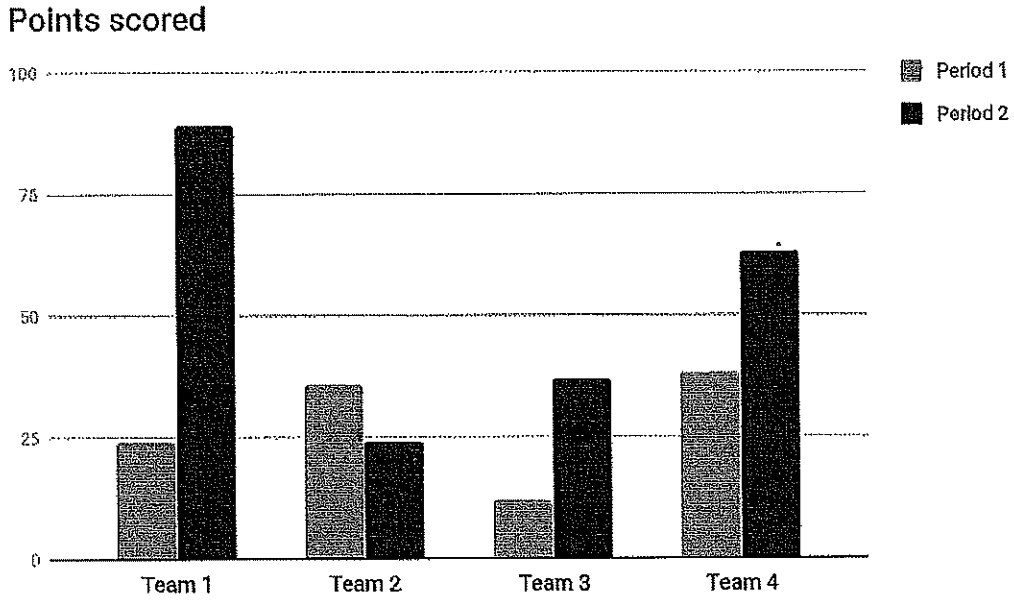
What data will you graph to answer the question?

Independent variable: _____

Dependent variable: _____

Name_____

Draw your graph below: Identify any changes, trends, or differences you see in your graph. Draw arrows pointing out what you see, and write one sentence describing what you see next to each arrow.



Interpret the data:

Make a claim that answers the scientific question.

What evidence was used to write your claim? Reference specific parts of the table or graph.

Explain your reasoning and why the evidence supports your claim. Connect the data back to what you learned about the relationships between coral, algae, and urchins.

Did the data support Sarah's hypothesis? Use evidence to explain why or why not. If you feel the data were inconclusive, explain why.

Your next steps as a scientist: Science is an ongoing process. What new question(s) should be investigated to build on Sarah's research? What future data should be collected to answer your question?