Join the national conversation!

CLONING: THREAT OR OPPORTUNITY?

Word Generation - Unit 1.04

Focus Words

design | feature | impact | potential | transfer

Weekly Passage

What makes you who you are? Both your genes and your experiences have an impact on your identity. Your genes contain information about your own unique design. They help determine many of your features, such as your eye color, your height, and which hand you use to write.

Scientists have invented a process called cloning that allows them to copy the genes of living things, or organisms. Scientists transfer some of an adult organism's genes to a new egg. After the transfer, a clone or copy of the original organism starts to develop. Researchers are using one type of cloning to study new treatments for diseases like cancer. They believe that cloning has the potential to help people with serious illnesses. Many farmers are cloning plants to produce crops featuring qualities that people like, such as juiciness in tomatoes. Some farmers are interested in cloning animals, too. For instance, they want to clone cattle that produce particularly tasty and tender beef.

In the future, scientists may be able to clone a person. This process could create identical twins born at different times. But is that a good idea? Many people worry about how cloning will impact our lives. What would happen if people could design other people? What if, for example, leaders could choose the features they wanted their soldiers to have and then make an army of clones? What if parents could clone their children? Should people be allowed to clone their pets? How might we take advantage of the benefits cloning offers while preventing potential problems?

TEACHER

Reading Comprehension/Discussion Questions:

- What would happen if your genes were transferred to a new human egg?
- What are some potential benefits of cloning?
- What impact could cloning have on the food we eat?
- If you could design an army of clones, what features would they have?
- Potentially, what could go wrong if people were able to clone their pets?

Unit 1.04

Cloning: Threat or opportunity?

Focus Word Chart

Word	Meaning	Forms			Related Words
		Inflectional	Basic Word Classes	Prefixes/ Suffixes	
design	(n.) - plan; blueprint	designs designed designing design (v.)		designer redesign designate designation	signature resign consign
feature	(n.) - quality, trait, characteristic	features (pl.) featured featuring features feature (v.)		featureless	
impact	(v.) - to affect or influence	impacts impacted impacting impact (n.)		impactful	
potential	(n.) - possibility			potentially potential (adj.) potentiate potent potency impotent	
transfer	(v.) - to move something from one place to another	transfers transferred transferring transfer (n.)		transferral transferrable transferability	infer refer confer defer

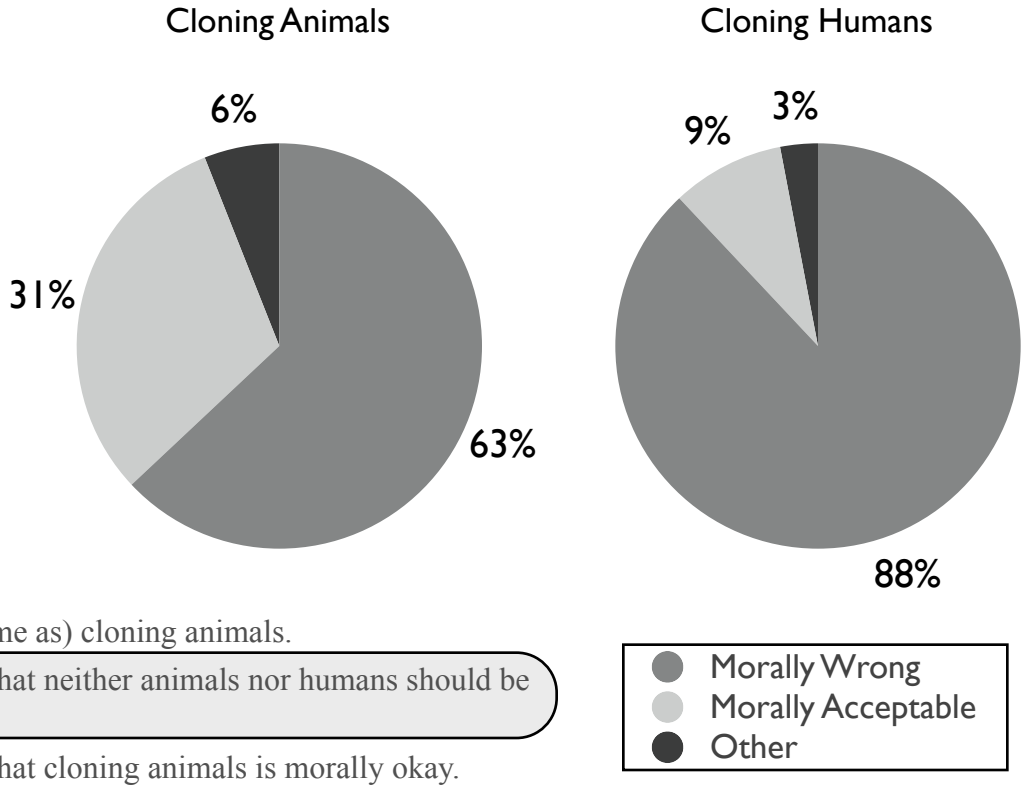
Unit 1.04

Cloning: Threat or opportunity?

Problem of the Week

Cloning an organism means **transferring** its genes to a new egg, and allowing a copy to develop with the same **design** as the original. Scientists are already cloning cows for the beef industry. They choose cows with especially tender meat, or other desirable **features**. There are many other **potential** applications of cloning. Should we clone endangered species? Many people need new organs to survive. Are human clones the answer? Despite the potential for good, many people worry about the **impact** of this new technology on our society.

Here are the results of a 2010 Gallup poll that told how Americans felt about cloning.



Option 1: Based on the graphs, which of the following statements is true?

A) Most Americans think that cloning humans is morally okay.

B) Most Americans believe that cloning humans is morally equivalent to (or the same as) cloning animals.

C) Most Americans think that neither animals nor humans should be cloned.

D) Most Americans think that cloning animals is morally okay.

Option 2: True or False: Based on the graphs, 25% of Americans believe that cloning animals is okay, but cloning people is not.

Answer: Actually, this is false. This would be true only if all of the people who disagree with animal cloning also disagree with human cloning. (Then, 88% - 63% = 25%) This seems likely, but based on the information given it is at least POSSIBLE that some people find animal cloning morally wrong, but human cloning morally okay.

Math Discussion Question: Many people believe that each human being is uniquely **designed** by God. Our society is built on the idea that each human is a special creature with special responsibilities and rights. Are these ideas in danger? Are you a unique and special individual, or are you simply a collection of **features**, like hair color, height, and IQ? What **impact** would human cloning have on the idea of human rights? Would human rights **transfer** to human clones? Why do so many Americans think cloning is wrong? What are some **potential** problems with cloning humans?

Unit 1.04

Cloning: Threat or opportunity?

Debating the Issue

1. Get ready...

Pick one of these positions (or create your own).

A Cloning of any kind should be forbidden.

B Cloning of plants should be allowed, but cloning of animals should be forbidden.

C Cloning of plants and farm animals should be allowed, but cloning of humans should be forbidden.

D Cloning should be allowed for research purposes related to treating disease (therapeutic cloning), but cloning of people (reproductive cloning) should not be allowed.

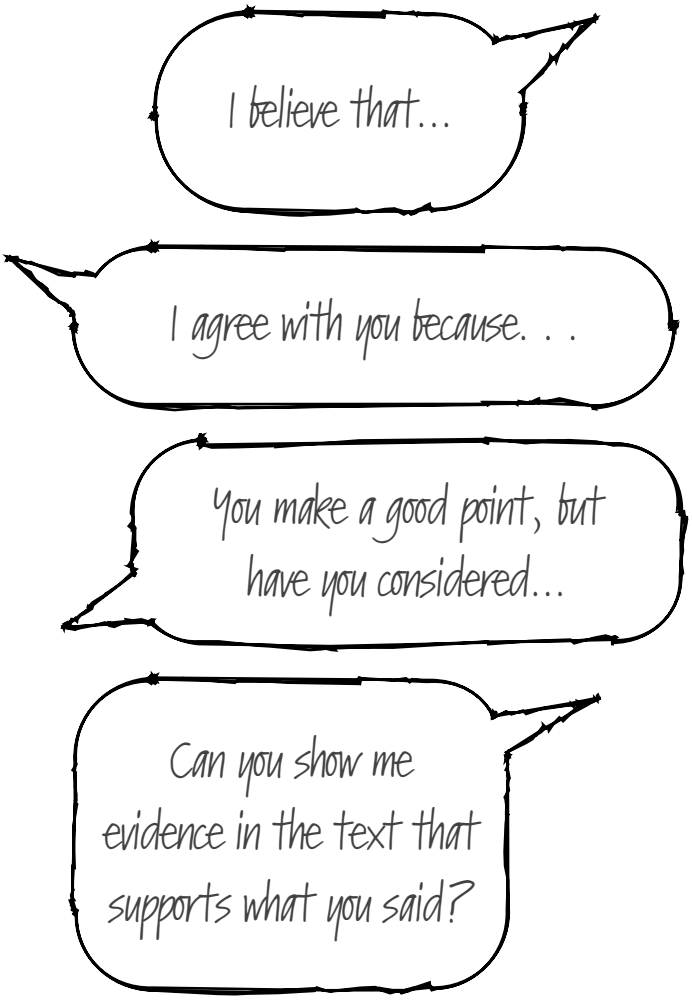
E _____

_____

_____

GO!

Be a strong participant by using phrases like these.



2. Get set...

Be ready to provide evidence to back up your position during your class discussion or debate. Jot down a few quick notes:

_____

_____

_____

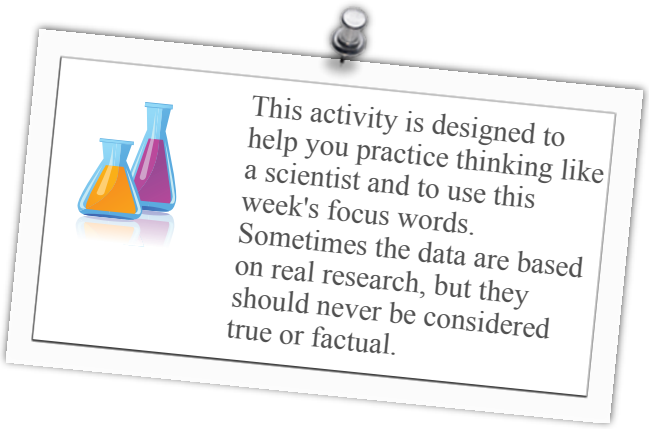
TEACHER

Whatever the debate format, ask students to use academically productive talk when arguing their positions. In particular, students should provide reasons and evidence to back up their assertions. It may be helpful to read these sample positions to illustrate some possibilities, but students should be encouraged to take their own positions about the issue at hand.

Unit 1.04

Cloning: Threat or opportunity?

Science Activity



Professor Seemy just read a newspaper article about cloning expert Lou Hawthorne and his two cloned dogs. The dogs were both cloned from Missy, a dog who died in 2002. Hawthorne **transferred** Missy's DNA to eggs taken from other dogs. The two clones have similar **features** and exactly the same genetic **design**. Hawthorne thinks dog cloning has the **potential** to be a big business.

"This could have a huge **impact** on the relationship between people and pets," thinks Professor Seemy. "But will people buy cloned dogs?"

Question:

Will people buy cloned dogs?

Hypothesis:

Most people will say that they would not buy a cloned dog.

Materials:

- 100 people

TEACHER

Real Research

-Students may wonder why the two clones have only similar features. Shouldn't their features be exactly the same? In fact, the two dogs don't look exactly the same. The article posits several reasons for this. The dogs were not cloned at the same time, so they may look different because of their age difference. Also, some features, like the direction that a dog's ears point and the curliness of its coat, have to do with collagen levels in utero, and so they can be different for dogs with the same genetic makeup.

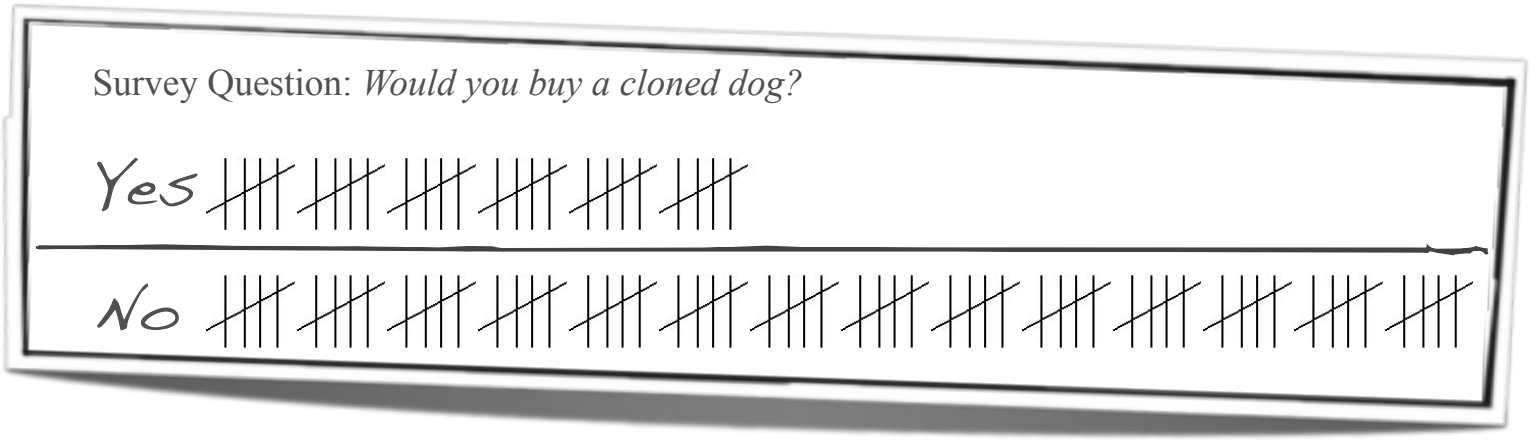
Konigsberg, E. (2008, December 31). Beloved pets everlasting. The New York Times. Retrieved on November 11 from

http://www.nytimes.com/2009/01/01/garden/01clones.html?pagewanted=1

Procedure:

1. Ask 100 people if they would buy a cloned dog.
2. Tally results.

Data:



Conclusion:

Is the hypothesis supported or not by the data?

Supported

What evidence supports your conclusion?

Seventy people out of 100, or 70%, would not buy a cloned dog.

How would you make this a better experiment?

Encourage students to consider sample size, number of trials, control of variables, whether the procedure is a true measure of the question, whether the experiment can be repeated by other scientists, data collection and recording systems, and other potential explanations for the outcome. Students should understand that these simple experiments represent the beginning of an exploration, not the end. If time permits, have students suggest how the experiment could be strengthened, emphasizing the use of the target words in the discussion.

Writing Prompt:

Should cloning be allowed? What impact might it have on people's lives?

Support your position with clear reasons and specific examples. Try to use relevant words from the Word Generation list in your response.

Focus Words

design | feature | impact | potential | transfer

A tool to help you think about your own writing!

Remember you can use focus words from any of the WG Units.

Check off what you accomplished:

Good Start

- ☐ Stated my own position
- ☐ Included 1 focus word

Pretty Good

- ☐ Stated my own position clearly
- ☐ Included 1-2 arguments
- ☐ Included 1-2 focus words

Exemplary

- ☐ Stated my own position clearly
- ☐ Included 1-2 arguments
- ☐ Included 1 counterargument
- ☐ Used 2-5 focus words

TEACHER

Ask students to write a response in which they argue a position on the weekly topic.

Put the writing prompt on the overhead projector (or the board) so that everyone can see it. Remind students to refer to the word lists in their Word Generation notebooks as needed.