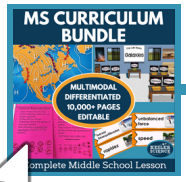
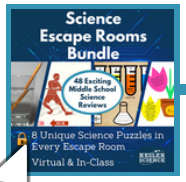
# What Can Kesler Science Do for You?

**4th - 8th grade science teachers love our Life, Earth, and Physical Science materials! With these easy and engaging materials, teachers can save planning time and put their focus back on the teaching that really matters.**



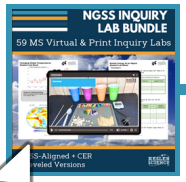

## 5E LESSONS

Two-week lessons with over 100 topics




## ESCAPE ROOMS

Engaging activities for review




## INQUIRY LABS

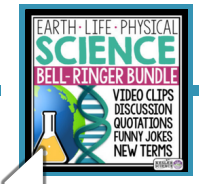
Three different levels to fit every student


## AMAZING ANCHORS

Anchoring phenomenon to book-end your lessons


## SUB PLANS

Never worry about planning for a sub again.




## WARM-UPS

Bellringers for the entire year


## STATION LABS

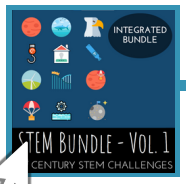
Student-led exploration


## INTERACTIVE NOTEBOOKS

Bring science journals to life.

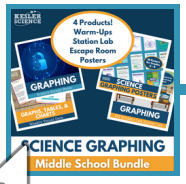

## WIKI TICKETS

Quick formative assessments




## STEM CHALLENGES

Real-world STEM problem-solving

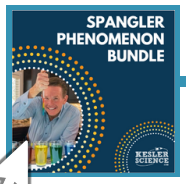



## GRAPHING

Table and charts and graphs ... OH MY!

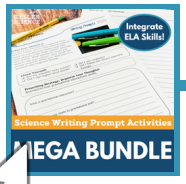

## SCIENCE READING COMPREHENSION

Leveled reading passages with mini-activities



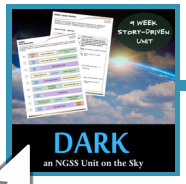

## SPANGLER COLLABORATION

Exclusive Steve Spangler lessons and videos




## WRITING PROMPTS

Writing activities covering 100+ topics




## EXPLORIES

Story-driven units with integrated activities

**The Kesler Science Professional Learning Network (PLN) group on Facebook has a huge community of engaged and supportive science teachers - come join us!**

KESLER SCIENCE

Name: _____

Date: _____

# Women of the Sea

In Korea, there is a community of people who spend most of their day - every day - swimming and diving. This might sound like paradise, but it's actually brutally hard work! The divers are women known as the Haenyeo, and amazingly, most of them are over 50 years old.

Jeju Island, home to the Haenyeo, is located about 50 miles south of mainland South Korea. For thousands of years, the Haenyeo (translated "sea women") have been diving in search of octopus, sea urchin, oysters, and kelp as a food source for their families. The work is dark and dangerous, especially in the chilly East China Sea, but the Haenyeo divers continue their work well into their 70s and 80s!

Scientists recently conducted tests on these impressive women to answer two questions: is there something special about the genes of these women that help them keep up this lifestyle? And has daily swimming changed their bodies in some way?

Scientists conducted a creative test in the lab. Three groups of Korean women participated in the experiment: Haenyeo divers, women from Jeju who do not swim for food, and women from the mainland. Scientists put equipment on the women to monitor their heart rates and oxygen levels. The test subjects then lay flat on their bellies and held their faces in cold water. 😕

When we go underwater during a swim, our internal body systems respond with something called the *mammalian dive reflex.* Our blood is directed away from our hands and feet and pushed back towards our heart and lungs. Also, our heart rate usually goes down, and our spleen might contract to get more blood moving through our blood vessels.

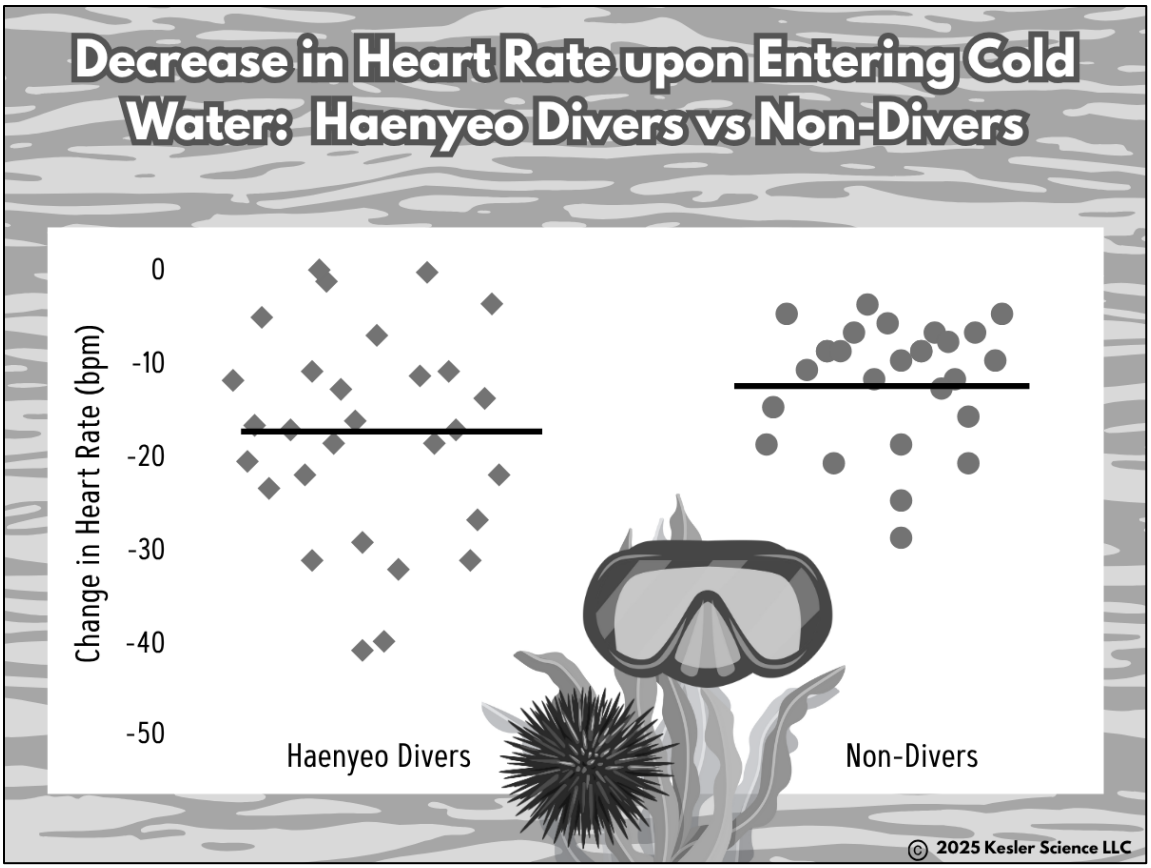
Our reflex is so automatic that our bodies will respond like we are completely underwater even if we just plunge our faces into cold water ❄️ By having all the test subjects hold their faces in cold water, the scientists were able to simulate diving, even with people who might have been terrible swimmers!

The scientists noticed a few interesting results in the Haenyeo divers. First, they reacted to the cold water much better than the other groups, so they have less risk of hypothermia. There might be a genetic reason for this: scientists also found there is a gene associated with tolerating the cold that pops up more in Haenyeo DNA. This might explain why some families have stayed with the traditions for so long, while others have left to find different work.

Secondly, the Haenyeo divers maintained a higher blood oxygen level while their faces were under water. This is likely an acquired trait, developed from holding their breath while they swim underwater up to two minutes at a time! Their lung capacity and heart rate have been trained like an elite athlete.

The following graph shows changes in the heart rate of Haenyeo divers compared to the non-divers.

# Woman of the Sea




1. What is the dependent variable in this graph?

_____

_____

2. What is the range of Haenyeo heart rate changes compared to the range in non-divers control heart rate changes? Why might this be difficult to interpret?

_____

_____

3. What does the black line within each point scatter represent? How do the Haenyeo compare to the control group?

_____

_____

_____

_____

Weekly Phenomenon Graphing Activity Teacher Key

*Blog Link:* [https://blog.keslerscience.com/phenomenon-and-graphing/women-of-the-sea](https://blog.keslerscience.com/phenomenon-and-graphing/women-of-the-sea)

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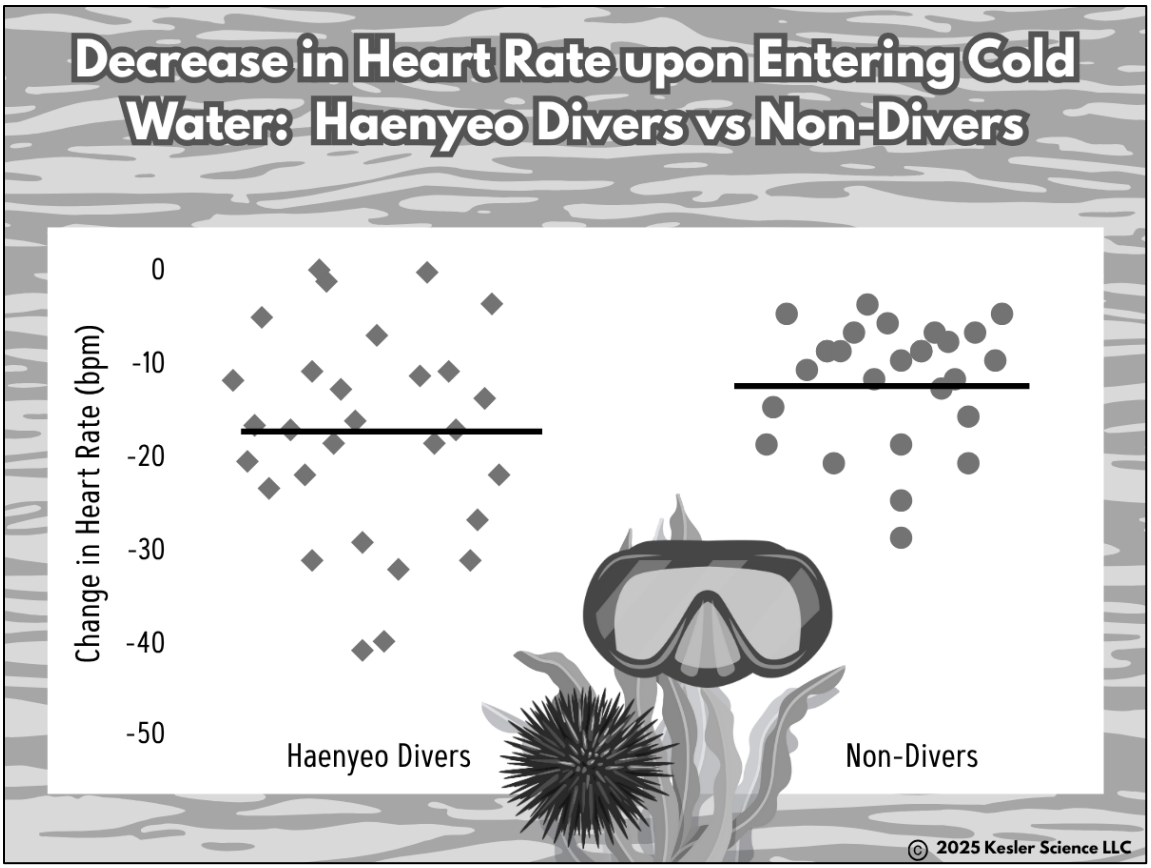


1. What is the dependent variable in this graph?

   *The dependent variable is "Change in Heart Rate (bpm)" or change in heart rate measured in beats per minute.*

2. What is the range of Haenyeo heart rate changes compared to the range in non-divers control heart rate changes? Why might this be difficult to interpret?

   *The Haenyeo heart rate range is from 0 decrease in bpm to about -40 decrease. For the non-diver controls, the range is from about -5 to -30 bpm. Based on this data, it may be difficult to interpret the impact of cold-water diving on the Haenyeo heart rate. Some individuals have no significant change in their heart rate while others have a drastic change.*

3. What does the black line within each point scatter represent? How do the Haenyeo compare to the control group?

   *The black line represents the average change in participant heart rate. The average Haenyeo diver decreases 18-19 bpm while the control group decreases at an average of 12-13 bpm.*