Exercise: The Key To Healthy Humans & Healthy Hamsters

Subject: Health, Science
Grade: Middle School, High School

Academic Standards:

- Next Generation Science Standards:
  - HS-LS1-3 Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis
- National Health Education Standards:
  - 1.12.2 Describe the interrelationships of emotional, intellectual, physical, and social health
  - 6.12.1 Assess personal health practices and overall health status
- National Agricultural, Natural Resource, and Food Standards:
  - AS.07.01. Design programs to prevent animal diseases, parasites and other disorders and ensure animal welfare

Introduction:
Ham is a winter white dwarf hamster. She is approximately a year old. While working with Ham, students noticed that she did not use her wheel much during the school day but that it required cleaning on a regular basis, suggesting Ham was using her wheel when we were not in the classroom. This raised questions like do hamsters need exercise, how much do hamsters exercise, do older hamsters exercise less than young hamsters, and what factors affect hamster activity and health.

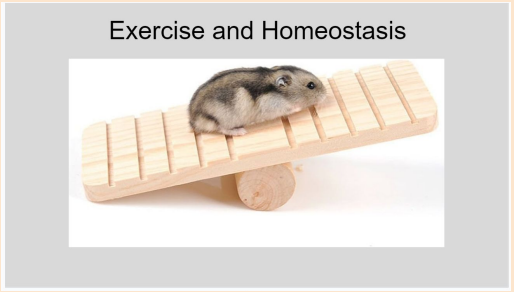
Students brainstormed ways of collecting data about how much Ham used the wheel. Suggestions included purchasing a monitored wheel, pointing a video camera at her cage, and adding an odometer to her existing wheel. For this preliminary investigation and due to cost and time, they chose the odometer option.

Essential Question:
How do living things improve their health and maintain homeostasis through exercise

Student Objectives: Students will demonstrate that

- they understand the importance of exercise to an organism's mental and physical health and homeostasis
- they can relate the reasons why an animal exercises to why people can and should exercise
- they can collect and analyze data
- they can work with animals in a respectful and considerate manner

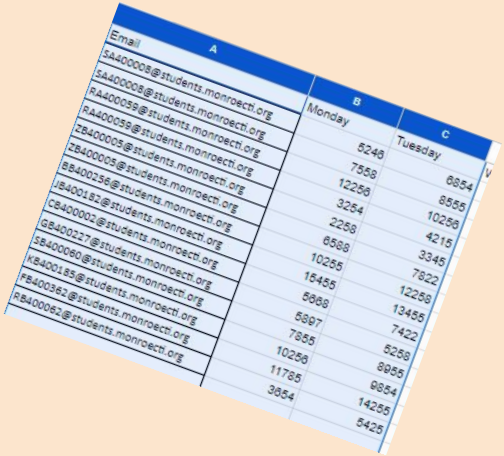
Lesson Procedure



- Making Predictions:
  - Students begin by making predictions about
    - how far Ham runs on her wheel
    - how far the students walk each day

- Testing Predictions and Collecting Data:
  - A bicycle odometer attached to Ham's wheel records her movement on the wheel and the results are recorded every morning for two weeks. No data is collected over the weekend.
  - Students use phone apps to keep track of their own movements throughout the day. Data is shared through a google sheet and used to create graphs of the data

- Analyzing and Sharing Results:
  - Data for each student, the group, and Ham are used to calculate the
    - Mean
    - Median
    - Mode
    - Range



A	B	C
Email	Monday	Tuesday
SA400008@students.monroecti.org	5246	
SA400009@students.monroecti.org	7556	6854
RA400059@students.monroecti.org	12256	8555
RA400058@students.monroecti.org	3254	10256
ZB400003@students.monroecti.org	2256	4215
ZB400005@students.monroecti.org	6598	3345
BB400256@students.monroecti.org	10255	7822
TB400182@students.monroecti.org	15456	12258
CB400002@students.monroecti.org	5668	13456
GB420227@students.monroecti.org	5697	7422
SB400060@students.monroecti.org	7955	5258
KB400185@students.monroecti.org	10256	8955
FB400362@students.monroecti.org	11785	9854
RB400061@students.monroecti.org	3654	14255
		5425

- Using Jamboard, students shared
  - possible explanations for why the results varied from day to day
  - other questions for future study
  - what was learned from the activity

- Once students were engaged in learning, direct instruction about the importance of exercise to health and homeostasis was given through videos and slide presentations

Day	Odometer Reading	Day	Odometer Reading
T	7.7 km	T	4.8 km
W	12.3 km	W	11.8 km
T	5.7 km	T	7.6 km
F	8.2 km	F	2.4 km

Mean	7.6
Median	7.7
Mode	8
Range	9.9

Continued on Page

Read and Understood By

Signed Date Signed Date

Reasons for Daily Variation

- *Ham had a busy day working with students so did less at night*
- *She didn't get out much today so was bored*
- *The weather was rainy on days she ran less*
- *The moon was full the first week*
- *The days she ran less, she ate more food, so maybe she needed to rest and recover*
- *She was depressed the days she ran less*
- *She was depressed the days she ran more*

New Questions and Ideas

- *Does she get more exercise from a ball or wheel*
- *If we do this when she is older will we get different results*
- *Could we build a hamster wheel for my cats*
- *If we show calories/km, who burns more… people or hamsters*
- *If we converted Ham-steps to Me-steps how far would she have run*
- *Can we keep a record of Ham's weight and how much she runs each day*

Continued on Page

Read and Understood By

Signed Date Signed Date

What We Learned

This activity makes me wonder how far wild chipmunks, mice, and other small mammals run in a day

John P

Hamsters have a lot more energy than I do

Joe R

This activity makes me wonder if hamsters prefer balls or wheels

Danica S

After watching how much Ham exercised I decided I probably need a little more exercise myself

Jodi B

I never dreamed that a little hamster could run that far in one night

Kaithlyn U

This activity made me realize that just like people, animals need exercise for their physical and mental health

Kyle J

I'm a superstar athlete!!

Ham

If Ham didn't have a wheel she would be one fat hamster

Jill S