Science Learning Packet

Grade 7:

Populations & Resources, Lesson 3

science learning activities for SPS students during the COVID-19 school closure.

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While Seattle Public Schools endeavors to only post documents optimized for accessibility, due to the nature and complexity of some documents, an accessible version of the document may not be available. In these limited circumstances, the District will provide equally effective alternate access.

Due to the COVID-19 closure, teachers were asked to provide packets of home activities. This is not intended to take the place of regular classroom instruction but will help supplement student learning and provide opportunities for student learning while they are absent from school. Assignments are not required or graded. Because of the unprecedented nature of this health crisis and the District’s swift closure, some home activities may not be accessible.

If you have difficulty accessing the material or have any questions, please contact your student’s teacher.
Populations and Resources:
Stability and Change in Populations

Investigation Packet
Hello Families,

We hope you and your family are well and safe during this time. During this unprecedented out-of-school time, the SPS middle school science team will be offering instructional opportunities for students that align with the district’s adopted middle school science instructional materials. This work is optional and non-graded.

This investigation packet is the first part in a series of district-aligned lessons about **Populations and Resources**, a 7th grade life science unit developed by AmplifyScience. While Amplify Science lessons are designed to be done in the classroom with peers, there are some activities that students can complete at home. In this packet you will find activities to accompany lessons 1 and 2 of the unit. **Accompanying lesson videos will be aired on SPS TV and posted the SPS webpage under Grade 7**, however this packet can be used with or without the accompanying video.

The videos can be accessed either online or through Seattle’s Public television programming on **SPS TV** (local channel 26), social media (Facebook and Instagram: @SeattlePublicSchools, Twitter: @SeaPubSchools), and our **SPSTV YouTube channel**. KOMONews.com will also host on-demand videos under the tab “Lesson Plan” and broadcast on channel KOMO 4.3. These supplemental learning videos feature short segments supporting a variety of subjects and grade levels. All videos will be close captioned on YouTube. For more information regarding the SPS TV broadcast schedule and to find the videos, please visit the following website: [https://www.seattleschools.org/departments/media_operations_center___sps-tv/broadcast_schedule](https://www.seattleschools.org/departments/media_operations_center___sps-tv/broadcast_schedule)

For students who have access to the internet and the following devices and browsers may wish to log-in to their AmplifyScience account from home are welcome to do so. See below for guidance on which browser

- **Desktops and Laptops** (Windows 7+, Mac OS 10.11+) - *Suggested browsers: Chrome & Safari*
- **Chromebooks** - *Suggested browser: Chrome*
- **iPads that support iOS11.3+ (iPad5+)** - *Suggested browser: Safari*

Sincerely,

Seattle Public Schools Science Department
Lesson 3: Population Sampling

The graph shows that the honeybee population was stable and then decreased. Which statement describes births and deaths when the honeybee population was stable (not changing)? (check one)

- [ ] There was the same amount of births and deaths.
- [x] There were more births than deaths.
- [ ] There were fewer births than deaths.

Which statement describes births and deaths when the population was decreasing? (check one)

- [ ] There was the same amount of births and deaths.
- [ ] There were more births than deaths.
- [x] There were fewer births than deaths.

Check in with someone to see if they agree with your ideas about the honeybee populations!
If you have access to internet, watch the video “Lesson 3”

If not, read the article below (adapted from BBC)

**Population Sampling**

It is impossible to count all the plants in a habitat, so a sample is taken. A quadrat is often used to sample plants. It marks off an exact area so that the plants in that area can be identified and counted.

- Quadrats should be placed randomly so that a representative sample is taken.
- Many quadrats should be placed so that a representative sample is taken.
- Quadrats may also be used for slow moving animals or non-moving organisms such as snails/slugs.

There are some limitations of using a quadrat. Human judgement can be an issue when using a quadrat. For example, some plants may be partially inside/outside a quadrat so there are basic rules that scientists follow that reduce the chance of human judgement affecting results.

It is impossible to find and count all the animals in an area. You can get an idea of the variety and number by taking a sample.

**Go outside and set up your own sample site! What type of insects and other living organisms can you count?**

Pitfall traps are often used to sample the small invertebrates living on the ground. You are likely to trap beetles and other insects, as well as spiders and slugs.

Mark and recapture is a method commonly used in ecology to estimate an animal population’s size where it is impractical to count every individual. A portion of the population is captured, marked, and released. Later, another portion will be captured and the number of marked individuals within the sample is counted. Since the number of marked individuals within the second sample should be proportional to the number of marked individuals in the whole population, an estimate of the total population size can be obtained by dividing the number of marked individuals by the proportion of marked individuals in the second sample.
Examining Moon Jelly Evidence

Below are two pieces of evidence about jelly populations over the course of 30 years (1980-2010).

Annotate the cards like the example given below.

### Analysis Questions

1. Which set of data do you think is a more accurate representation of the jelly population? Explain your thinking.

   This shows that there was one sample site for jelly collections that produced this data.
See the example below of what a model looks like for this Honeybee Population:

The key shows that a box represents an organism in a population, a crossed-out box represents a death, and a new box with a “B” represents a birth.

- First, I need to figure out how many births and deaths to show for the stable population. As the key explains, to show a birth I draw a box with a “B.” To show a death, I cross out a box that is already there. If I wanted to show the same number of births as deaths, I could add two boxes with “B” and cross out two boxes.

- If I wanted to show more deaths than births, like what must be occurring in the decreasing honeybee population I could cross out one more box than I write “B” in for. If I wanted to show more births than deaths I could add one more box with a “B.” than my crossed out boxes.

Note that it is not important exactly how many births and deaths you draw, but it is important to show how the number of births compares with the number of deaths when the population is stable or changing.
Check your Understanding:

The boxes represent individual jellyfish, look at the key below and fix the model so it represents a stable and increasing jellyfish population.

Use the Honeybee example to help you complete the diagram for the Moon Jellies.

Key
- organism in population
- Cross out a box to show a death.
- Draw a new box with a "B" in it to show a birth.

Check your ideas with the answer key on the next page!
**Key**

There are two possible ways that the moon jelly populations could be increasing in size. The births have to be more than the deaths, so either the **births increased** or the **deaths decreased**.

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**Births and Deaths in the Moon Jelly Population**

**Goal:** Show the births and deaths in the moon jelly population when it was stable and when it was increasing.

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**Stable**

Figure 1: The number of births increased, so the number of births are greater than the number of deaths.

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**Increasing**

Figure 2: The number of deaths decreased so the number of births is greater than the number of deaths.