Seabird Population Scenarios

Use the list of **scenarios** to **generate changes** in your Black Guillemot population. The playing cards will determine your scenario. Pick a starting population between 350 and 950.

1. **Draw** a playing card.
2. **Find** the number of your card on the sheet of scenarios. This tells you what happens to your guillemots this season.
   (Ace=1, Jack=11, Queen=12, King=13, number cards = their value)
3. **Calculate** your new population of birds.
4. **Record** the season, scenario, your work and your new population number.

Math Vitamin: Black Guillemot Research Scenarios

1. New nest boxes laid out by scientists have protected many of the chicks from polar bears and the population **doubles**.

2. **Half** of the guillemots find a new source of food, fish called sculpins, and they each raise **one** chick. As for the other **half**, **half** of them raise **2** chicks, and the other **half** raises **zero**.

3. Your guillemots fly far out to sea. On their way back to the island, **33** don't make it through a storm, but **sixty-two** new birds get blown off course and settle on your island.

4. Puffins are trying to move in! They have taken over **10** nest sites. Decrease the population by 15 chicks.

5. **Twelve** marauding polar bears have eaten **3** chicks each.

6. Summer was short and only **27** pairs of birds were able to mate, lay eggs, and raise chicks. Add 27 chicks to your population.

7. Summer was mild and long and for every current <u>pair</u> of birds, **two** chicks are hatched.

8. An oil spill causes **82** of the birds to die.

9. There is little sea ice and, therefore, very few Arctic cod. **47** seabirds die.

10. Over the course of the summer, **9** polar bears eat **4** birds each.

11. There have been large schools of Arctic Cod this month, which has kept the seabirds well fed. A **quarter** of the population triples, and one **half** of the population doubles, and the last **quarter** don't produce any chicks.

12. Each nesting pair of birds produced **1** chick, but then Jaeger came through and ate **half** of the chicks.

13. Early snow fell and only the toughest birds survived. **43** guillemots didn't make it.

14. **Eight** Arctic foxes snuck into the bird's territory and half of them ate **3** chicks each, the other half ate **5** chicks each.

15. **Fifteen** guillemots are caught in a fisherman's net while fishing for cod. **5** manage to free themselves and return to the island.

*** If your population goes down to 0, check in with a teacher!!

Science-Classroom Connections

In **Science**, students:
- Learned about the biology of Black Guillemots based on a 40 year field study
- Experimented with spring scales and calipers, tools used in the field to collect data
- Explored the impacts of decreasing pack ice on breeding success
- Designed nest boxes to protect chicks and eggs
- Investigated climate change through one Arctic ecosystem

In **Math**, students:
- Solidified the subtraction algorithm
- Practiced addition, arrays, division, and fractions
- Practiced graphing their own data and data from scientists
- Used coordinate grids to manage nest site placement
- Built understanding of time and fractions by creating schedules for researchers

In **Language Arts**, students:
- Practiced finding information in non-fiction reading
- Wrote creative writing stories incorporating concepts learned in science