Academic English: Intermediate

Coral polyp spawning

- Many organisms breed in a limited season.
  - Some birds: born spring, migrate in autumn
  - Some frogs: eggs only during rainy season

Coral polyp spawning

- Reef building coral – extremely limited season
- *Nearly every polyp spawns on one day.*

- *Why so limited?*

Coral polyp spawning

- **Hypothesis: Coral gain some advantage by spawning all at once.**

- Procedure:
  - Take 1 paper & one envelope of 'gametes'.
  - Run the spawning experiment for your number.
  - Report total matches you recorded.

- Discuss the questions in Part 2.

Coral polyp spawning

Hypothesis: Coral gain some advantage by spawning all at once

Part 1: Spawning simulation

Group 1, 3, 5, and 7: Spawning over five nights
1. Take 10 orange "gametes".
2. Place five pieces on a desk. They represent five gametes (eggs or sperm) that have been released by coral polyps.
3. Stand 1 meter away from the desk. Take turns throwing the other five pieces onto the desk.
4. Each time you throw a piece, record whether it touches another piece. Two pieces touching represents one fertilization. (In nature, fertilization only occurs when a male and a female gamete touch, but this model ignores that.)
5. When you finish, pick up five of the pieces and repeat the experiment. Do this five times.
6. Fill in the chart below. This represents your reproductive success.

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	TOTAL

Group 2, 4, 6, and 8: Spawning on one night
1. Take 50 blue "gametes".
2. Place 25 pieces on a desk. They represent 25 gametes (eggs or sperm) that have been released by coral polyps.
3. Stand 1 meter away from the desk. Take turns throwing the other 25 pieces onto the desk.
4. Each time you throw a piece, record whether it touches another piece. Two pieces touching represents one fertilization. (In nature, fertilization only occurs when a male and a female gamete touch, but this model ignores that.)
5. Fill in the chart below. This represents your reproductive success.

Trial 1	TOTAL

Part 2: Discussion

1. Which experiments yielded more collisions, spawning over five nights or on one night? Try to explain why the number of collisions was not equal.

2. If you repeated the experiment, would you expect exactly the same numbers? Explain why or why not.

3. Based on this model, which mode of reproduction would be more successful for the corals, reproduction in a single night or over a longer time?

★ 4. Like most simplified models, this is a little unrealistic. What are some factors which affect coral reproduction in nature that are not included in this model?

★ 5. In nature, predators try to eat the gametes. Which type of reproduction would be more successful if there is a predator in the area? Why do you think so?

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spawning: 産卵; gametes: 配偶子; egg: 卵子; sperm: 精子; model: 実験

Adapted from "Coral spawning – student activity". www.coral.noaa.gov/

Coral polyp spawning

- Which experiment yielded more collisions?
  - spawning on one night
- Would you expect exactly the same numbers?
  - no, some variation
- Which mode of reproduction is more successful?
  - a single night

What is logic?

- Logic: A formal system to support or prove a conclusion

  – Conclusion: A statement shown to be true (or false) by the logical argument

  – Premise: Statements used as evidence to support the conclusion

  – Argument: The set of premises and conclusion

Argument: Example 1

Premise 1: Non-renewable resources have a limited supply.

Premise 2: Coal is a non-renewable resource.

Conclusion: Coal has a limited supply.

Argument: Example 2

Premise 1: All squares are also rectangles.

Premise 2: A is a square.

A

Conclusion: A is also a rectangle.

Argument: Example 3

Premise 1: If a river is narrow, it is easy to cross.

Premise 2: Yada River is narrow.

Conclusion: Yada River
              is easy to cross.

Argument: Quiz

- Which premise provides the best support for the conclusion, "Peter is in Japan"?

  1. Peter always watches the Grand Sumo Osaka Basho.

  2. Peter is in Sapporo.

  3. Peter works for Mitsubishi.

Argument: Quiz

- Peter is in Sapporo.

- Sapporo is in Japan.

- Therefore, Peter is in Japan.

Use logic in writing

- Use logic to build an argument.
  - Explain each premise.
  - Provide evidence for each premise.
  - Explain how the premises are connected to the conclusion.
- This should ensure that your logic is valid.

Use logic in writing

- **Thesis statement:** Dominant genetic traits are not more common than recessive ones.
  - The allele for white hair in cats is dominant.
  - White cats are not more common than other colors.
  - Therefore, the dominant trait is not more common that the recessive trait.

Use logic in writing

Introduction: Many people think dominant traits are common.

- The allele for white hair in cats is dominant.

Paragraph: Explain dominant, recessive. Give evidence W is dominant.

- White cats are not more common than colored cats.

Paragraph: Evidence white cats not common; Explain source of evidence

- Therefore, the dominant trait is not more common that the recessive trait.

Conclusion: Summarize how premises, evidence support thesis statement

Use logic

- Think of premises to support your conclusion.

- Give evidence that the premises are true.

- Explain how premises support the conclusion.