

The Galapagos Risk Game

This game is designed to practice answering Evolution and Environment questions. They are based on the AQA B1b Module but other syllabuses may group these topics differently.

This game can be played with 2, 3 or 4 players. The following pages contain the game board, and 4 question sheets, each with a different set of true or false questions. Rules for playing each game are included on the playing board.

There are 3 games in this series available from GamePlan Games. All the games use the same 'True or False' questions, but each game offers a different playing objective. You can renew your motivation for learning the same facts by playing a different game. If you would like some new questions, why not buy the "Round the Block" game from our website?

Here is a summary of the Evolution and Environment games, which are available for FREE download from www.GamePlanGames.co.uk

| Game | No. of players | No. of sheets | Playing objective |
|-------------------------|----------------|---------------|---|
| Save the Earth Boxes | 2, 3 or 4 | 1 | To claim the most boxes |
| The Camel's Beetle Game | 1, 2, 3 or 4 | 1 each | To answer up to 5 questions correctly in a row. |
| Galapagos Risk Game | 2, 3 or 4 | 1 | To dominate the island by successful colonisation |

You can also download and print off the Revision Sheet which is designed to help you to understand why an answer you thought was right is actually wrong.

Please use the "Contact us" button on the web site to say whether you like this new game.

Galapagos Risk Game

Darwin found a lot of different finches, each with a different beak and feeding on different types of food. This game simulates the 'survival of the fittest' idea that he worked out.

Preparation

- Cut out the queen finch hexagons and their 36 matching offspring squares.
- Each player chooses a queen finch hexagon and places them on a numbered home territory on the board. The numbered hexagons indicate the starting positions according to the number of players, e.g. for 2 players the two hexagons marked "2" will be used. It is best to choose a finch that matches its home territory!
- Each player takes a question sheet.
- Decide who will start.

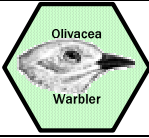
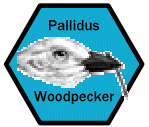
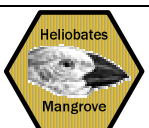
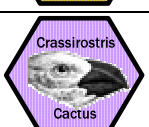
To Play

- On their go, each player decides which territory they want to try and populate. **This territory must be directly next to one that they already own.**
- The player to the left of the player is the Question Master for this players go.
- The Question master checks how many questions that the player must answer correctly to populate the territory. They do this by checking the Invasion table for the invading finch and the target territory.
- The Question master then asks the player the indicated number of 'true or false' questions.
- The Question master checks the answers in the grid on the question sheet.
- If the player answers all the questions correctly then...
 - If the target territory is unoccupied then that the player can place an offspring on the board in the target territory, thus extending and **marking their Colony.**
 - If the target territory is occupied, then the player for the occupying finch answers **one question in defence**, which if correct, repels the challenge.
- Play continues with the next player, moving round in a clockwise direction, players taking it in turns to ask questions and extend their colony by correctly answering questions.
- If a colony completely surrounds a group of opposing finches on their go, all the captured offspring squares are removed from that area. The queen finch hexagon is not removed.

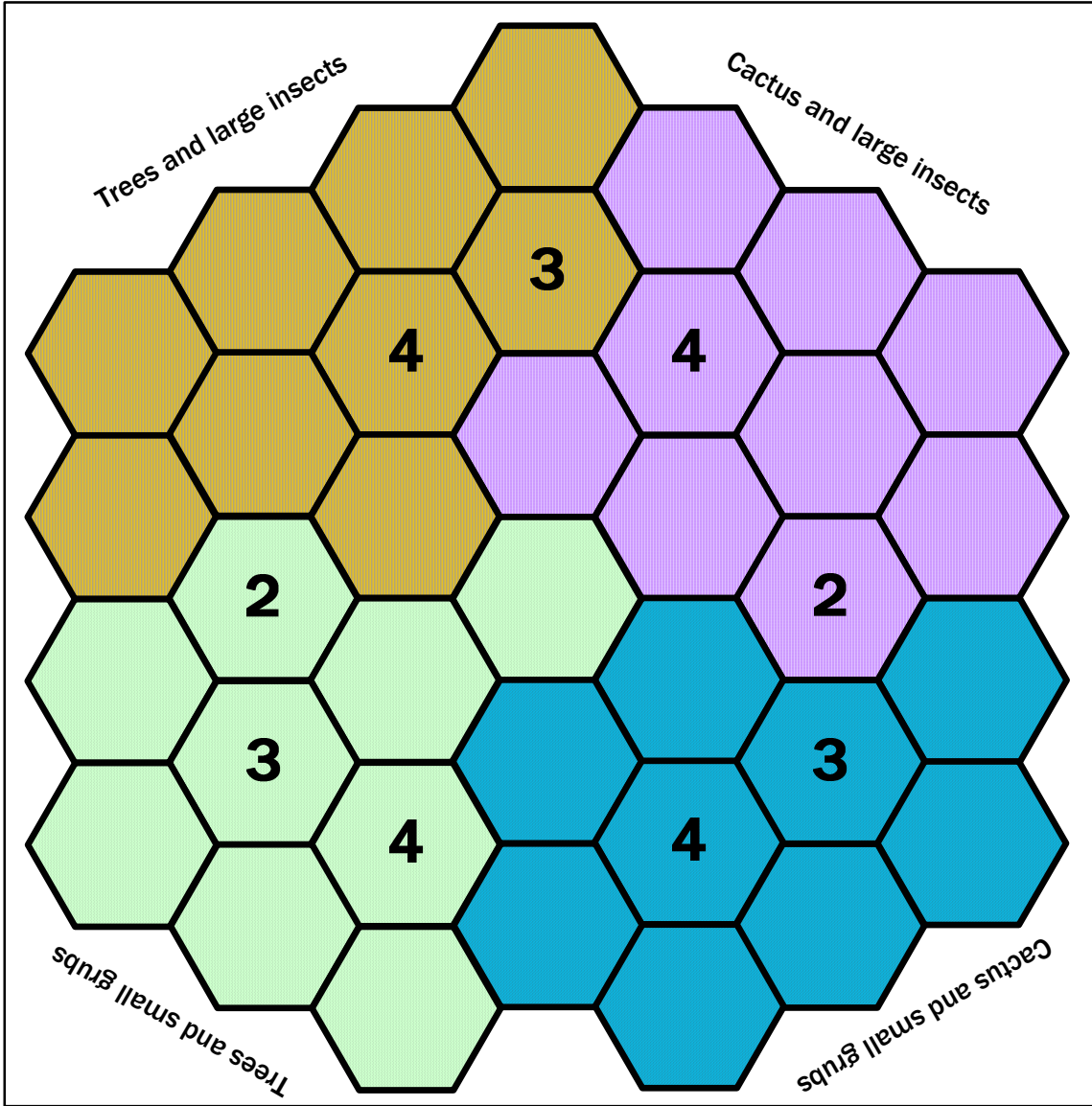
Ending the game

- Play continues until:
 - a) The whole island becomes one colony. The player who has colonised the whole island is crowned King Finch!
 - b) A pre-agreed time or question limit is reached. The player with the largest colony wins!
 - c) There is a stalemate – everyone keeps getting all the questions right. All players agree to end the game and the player with the largest colony is declared the winner.

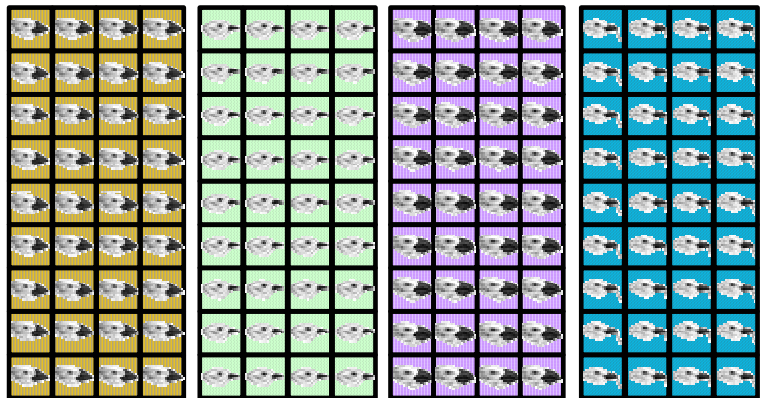
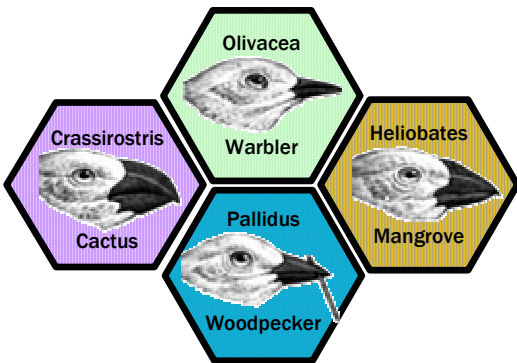
Invasion Table

| | | Territory type (Habitat) | | | |
|--------------|---|--------------------------|-----------------------|--------------------------|------------------------|
| | | Trees and large insects | Trees and small grubs | Cactus and large insects | Cactus and small grubs |
| Finch |  | 2 questions | 1 question | 3 questions | 2 questions |
| |  | 3 questions | 2 questions | 2 questions | 1 question |
| |  | 1 question | 2 questions | 2 questions | 3 questions |
| |  | 2 questions | 3 questions | 1 question | 2 questions |





Queen finches



Evolution and the Environment A – True or false?

1. Large animals survive better in the Arctic than small ones because they have a large volume to generate heat but a small surface area to lose it.
2. African elephants keep cool because their ears have a large surface area for losing heat.
3. Camels can close their nostrils to keep them warm at night.
4. When the weather is hot and dry, plants lose water more slowly than when it is raining.
5. Succulents live in dry areas by keeping a store of water in their leaves.
6. The resurrection plant can survive even after losing 99% of its water.
7. Early flowering bulbs grow and flower before the leaves come out on the trees.
8. Weeds grow quickly but let the other plants have plenty of light and nutrients.
9. Inheritance is the way parents teach their offspring.
10. A tissue culture could be small groups of cells taken from an animal and then grown.
11. Sex cells are called embryos.
12. Thread-like structures carrying information for many characteristics are called chromosomes.
13. Animal cloning has been fully evaluated and now it is safe to make human clones.
14. Infant clones do not carry the same genetic information as their parent.
15. People who object to cloning often do so, on moral and ethical grounds.
16. Fossil records show that amphibians came before bony fish.
17. Animals may have become extinct because of volcanic eruptions.
18. Darwin proposed that the old species were more complicated life forms.
19. Reducing poverty means that resources should be shared more fairly.
20. A community is a population of organisms.
21. Nuclear power stations produce a lot of carbon dioxide.
22. Untreated sewage increases the amount of oxygen in a river.
23. Cows produce methane.
24. Farmers use fertilisers to stop their crops being eaten by insects.
25. Lichens are simple plants that can be used to indicate how old a forest is.
26. The gas that lichens are sensitive to is sulphur dioxide.
27. Energy absorbed by the atmosphere makes the Earth cooler.
28. Over the last 160 thousand years the concentration of carbon dioxide in the air has fluctuated, but shown an overall decrease.
29. Forests absorb carbon dioxide.
30. Recycling and reusing things is a bad idea because the earth has plenty of resources.

Answers

| True | False |
|--|---|
| 1, 2, 5, 7, 10, 12, 15, 17, 19, 20, 23, 25, 26, 29 | 3, 4, 6, 8, 9, 11, 13, 14, 16, 18, 21, 22, 24, 27, 28, 30 |

Evolution and the Environment B – True or false?

1. To keep warm in the Arctic, Polar bears' white coats reflect light.
2. Reptiles like living in the arctic because they are cold blooded.
3. A camel's hair is woolly to keep in warm at night time.
4. A carnivore is an animal that eats plants.
5. Transpiration is the use of water for photosynthesis in the leaves.
6. Some plants reduce transpiration by only having a few stomata.
7. The spines on a cactus are very small leaves which reduce transpiration.
8. Robins mark out an area called a territory to exclude other male robins.
9. Herbivores are animals that only eat plants.
10. Tissue cultures involve cutting up chromosomes.
11. Characteristics like eye colour are controlled by the genes.
12. Genetic engineering involves transferring genes from one organism to another.
13. Cloned animals look identical because they have the same genes.
14. Cloning involves sexual reproduction.
15. Asexual reproduction makes offspring that are identical to the parent.
16. Scientists are not certain how life began on earth because the evidence has not survived.
17. 200 million years ago a large number of animals became extinct.
18. Lamarck thought that species can improve by passing experiences learned by one animal to its offspring.
19. 'Survival of the fittest' results in a weaker population because so many get killed.
20. Reducing poverty means reducing pollution.
21. We have no need to do anything about pollution.
22. The main substance given off by car exhausts is carbon dioxide.
23. Treating sewage involves pumping air through the water to digest the solid matter.
24. Sulfur dioxide prevents rivers and lakes becoming acidic.
25. Catalytic converters remove nitrogen oxides from car exhaust gases.
26. Lichens do not grow well in clean air.
27. Methane reflects energy radiated by the earth.
28. Sulphur dioxide is thought to be the main greenhouse gases.
29. Cutting down trees reduces the rate at which carbon dioxide can be removed from the air.
30. Sustainable development means using up resources because it doesn't matter about future generations.

Answers

| True | False |
|---|--|
| 3, 6, 7, 8, 9, 11, 12, 13, 15, 16, 17, 18, 22, 23, 25, 29 | 1, 2, 4, 5, 10, 14, 19, 20, 21, 24, 26, 27, 28, 30 |



Evolution and the Environment C – True or false?

1. To survive in the Arctic, walrus have a store of fat to keep them warm.
2. A camel's hair is soft to prevent sunburn.
3. Snakes are covered in scales to stop moisture from evaporating.
4. Some animals avoid being eaten by being brightly coloured pretending to be poisonous.
5. Transpiration is the evaporation of water from the leaves.
6. At the seaside, marram grass avoids being eaten by having tightly curled leaves.
7. The spines on a hedgehog are good for helping it to avoid being eaten;
8. Deer fight to kill all the other male deer.
9. Peacocks display to win the best females.
10. Plants with tasty fruits have their seeds dispersed by animals carrying them away.
11. Genetic engineering involves transferring cells from one organism to another.
12. Embryo transplantation involves splitting apart genes with enzymes.
13. In cloning, the egg cell is fertilised with a sperm.
14. Asexual reproduction is producing offspring using sex cells.
15. Genetically modified plants that will not reproduce naturally, are designed to make clients buy new seed every year.
16. Animals first appeared on earth about 3 million years ago.
17. Dinosaurs became extinct because they ate one-another.
18. The Bible describes creation of individual species by God.
19. Some animals may now be extinct because they were too silly.
20. Converting marshes into crop growing areas is likely to reduce the number of plant species there.
21. Nuclear power stations produce no carbon dioxide.
22. Mercury is no problem once it is discharged by a factory into the sea.
23. Pesticides and herbicides can pollute water.
24. Toxic chemicals used to kill insects are called pesticides.
25. Nitrogen oxides in the air create acid rain.
26. The best indicators of pollution in rivers are the fish.
27. The number of species in an environment indicates how polluted it is.
28. Landfill sites are bad places to build houses.
29. Plants increase the amount of carbon dioxide in the air.
30. Sustainable development means conserving resources and leaving some for future generations.

Answers

| True | False |
|--|---|
| 1, 3, 4, 5, 7, 9, 10, 15, 18, 20, 21, 23, 24, 25, 27, 28, 30 | 2, 6, 8, 11, 12, 13, 14, 16, 17, 19, 22, 26, 29 |

Evolution and the Environment D – True or false?

1. To survive in the Arctic, seals have thick fur.
2. The arctic hare has a white coat which acts as good camouflage in the snow.
3. Snakes are covered in scales to stop moisture from evaporating.
4. Some animals avoid being eaten by being brightly coloured to warn predators that they are poisonous.
5. Willow trees do not need much water.
6. Some plants have leaves with a thick waxy cuticle to stop the leaves getting too wet.
7. Camels cannot eat cacti because they are too prickly.
8. An animal with a territory ensures that all other species keep out of it.
9. Information is passed from parents to young in sex cells.
10. Chromosomes are spread evenly throughout a cell's cytoplasm.
11. New plants can only be grown from old ones by growing seeds.
12. Cloning is a method of asexual reproduction.
13. In animal cloning, an egg cell first has its nucleus removed.
14. Identical twins are natural clones.
15. No-one objects to animal cloning because it is natural.
16. Scientists know that extinct animals once lived because of fossil records in the rocks.
17. Some animals may have become extinct because of diseases.
18. New forms of genes can arise in new cells by a process called mutation.
19. The earth's population has risen significantly in the last 1000 years.
20. Quarrying is a good way to improve habitats.
21. The main substance that produces acid rain is sulphur dioxide.
22. Mercury in the sea can get into the fish we eat.
23. One substance produced by rice fields is methane.
24. Lichens are simple plants that aren't damaged by air pollution.
25. Lichens do not grow well in smoky atmospheres.
26. The best indicators of pollution in rivers are the invertebrate animals.
27. Landfill sites do not release methane into the air.
28. Factories built on landfill sites can suffer from subsidence.
29. In paddy fields, growing rice decreases the amount of methane in the air.
30. Replanting trees is an example of sustainable development.

Answers

| True | False |
|--|---|
| 2, 3, 4, 9, 12, 13, 14, 16, 17, 18, 21, 22, 23, 25, 26, 28, 30 | 1, 5, 6, 7, 8, 10, 11, 15, 19, 20, 24, 27, 29 |