

BUILDING A NEST

Read the true story below, then make an inference based on the evidence in the story.

¹Ornithologists are people who study birds. ²Sometimes they can get quite technical when they classify birds, and other times, they can be very general. ³For instance, they may loosely classify waterfowl as any swimming birds. ⁴Another general classification is applied to 275 quite different kinds of birds based on the method these birds use to build their nests. ⁵All 275 birds, found in different parts of the world, build their nests by crossing leaves, twigs, and grass over and under each other until the nest is formed. Can you infer the name ornithologists have given to all these birds who build their nests in this way?

Your conclusion: _____

Which sentence has the best evidence to support your conclusion? _____

THE TIMELINE GAME

Using the clues, cross out each wrong answer to match each scientist with his invention, and the year of the invention.

Michael Faraday	Elisha Otis	Edwin Drake	Walter Hunt
1831	1831	1831	1831
1849	1849	1849	1849
1852	1852	1852	1852
1859	1859	1859	1859
oil drill	oil drill	oil drill	oil drill
safety pin	safety pin	safety pin	safety pin
electric generator	electric generator	electric generator	electric generator
safety elevator	safety elevator	safety elevator	safety elevator

- The safety elevator and the oil drill were invented later than the electrical generator and the safety pin.
- Faraday and Hunt made the earliest inventions.
- The oil drill came exactly ten years later than Hunt's safety pin, and Faraday's invention was made before **Otis'** safety elevator.

Faraday _____

Otis _____

Drake _____

Hunt _____

IT'S A GAS

Read the true story below, then make an inference based on the evidence in the story.

¹The will-o-the-wisp is a ghostly light sometimes seen over swamps or marshes. ²Scientists know these lights are caused by the burning of methane or marsh gas produced by decaying plants. ³People used to believe it was an evil spirit that enjoyed misleading travelers. ⁴They followed the light and soon found themselves deep in a swamp and in serious danger. ⁵Despite this evil reputation, on one holiday, people decorate an object designed to look just like the will-o-the-wisp. Can you infer the name of this holiday and the name of the decorated object?

Your conclusion: _____

Which sentence has the best evidence to support your conclusion? _____

FIGURE OUT THE ORDER

Using the clues, cross out each wrong answer to match each animal to its life span.

AVERAGE LIFE SPANS OF SELECTED ANIMALS

25 Years	20 Years	12 Years	10 Years	7 Years
baboon	baboon	baboon	baboon	baboon
dog	dog	dog	dog	dog
giraffe	giraffe	giraffe	giraffe	giraffe
grizzly	grizzly	grizzly	grizzly	grizzly
kangaroo	kangaroo	kangaroo	kangaroo	kangaroo

- On average, a giraffe lives exactly half as long as the average baboon.
- The average dog lives longer than the average kangaroo, but not as long as the average grizzly bear.

25 years _____

20 years _____

12 years _____

10 years _____

7 years _____

A GOOD TERN

Read the true story below, then make an inference based on the evidence in the story.

¹The tern is a subfamily of seabirds related to gulls. ²Terns are especially known for their power of flight. ³Terns have long pointed bills that are useful both for spearing fish and for being aerodynamic. ⁴Terns also have pointed wings that allow them to travel swiftly through the air and for long distances. ⁵They need them because the arctic tern migrates farther than any other bird. ⁶Some arctic terns migrate an amazing 22,000 miles a year. ⁷This means these terns fly 11,000 miles each way. Can you infer where the arctic tern is flying to when it migrates from the Arctic to a place 11,000 miles away?

Your conclusion: _____

Which sentence has the best evidence to support your conclusion? _____

THE TIMELINE GAME

Using the clues, cross out each wrong answer to match each scientist with his invention, and the year of the invention.

Cyrus McCormick	Samuel Colt	Joseph Niepce	John Gorrie
1827	1827	1827	1827
1832	1832	1832	1832
1834	1834	1834	1834
1844	1844	1844	1844
refrigerator	refrigerator	refrigerator	refrigerator
revolver	revolver	revolver	revolver
photography	photography	photography	photography
reaper	reaper	reaper	reaper

1. Photography and the revolver were invented before the refrigerator and the reaper.
2. Colt's invention was made after photography was invented but before the reaper, and Gorrie did not invent either photography or the reaper.
3. McCormick, whose invention was after Niepce's invention, did not invent the refrigerator, which was invented in 1844.

McCormick		
Colt		
Niepce		
Gorrie		

HAWK TO ME

Read the true story below, then make an inference based on the evidence in the story.

¹The nighthawk is not a hawk at all but is related to the whippoorwill family. ²It apparently earned the name hawk because when it takes off at sunset, it circles in the sky much like real hawks circle in the sky. ³Real hawks circle until they spot something edible and swoop down and capture it with their powerful talons. ⁴The nighthawk circles around with its mouth wide open, gobbling down flying insects. ⁵This behavior has earned it a second name as another kind of hawk. Can you infer what kind of hawk the nighthawk really is?

Your conclusion: _____

Which sentence has the best evidence to support your conclusion? _____

THE TIMELINE GAME

Using the clues, cross out each wrong answer to match each scientist with his invention, and the year of the invention.

Walther Bauersfeld	Theodore Maiman	Bill Hamilton	Frank McNamara
1923	1923	1923	1923
1950	1950	1950	1950
1954	1954	1954	1954
1960	1960	1960	1960
jet boat	jet boat	jet boat	jet boat
geodesic dome	geodesic dome	geodesic dome	geodesic dome
laser	laser	laser	laser
credit card	credit card	credit card	credit card

- The jet boat was invented after the credit card, the laser was invented after the jet boat, and the credit card was invented after the geodesic dome.
- Hamilton made his invention after Bauersfeld made his invention, Maiman made his invention after Hamilton made the jet boat, and McNamara made his invention **after** Hamilton.

Bauersfeld	_____	_____
Maiman	_____	_____
Hamilton	_____	_____
McNamara	_____	_____

YOU NEED NEW MATERIAL

Read the true story below, then make an inference based on the evidence in the story.

¹In 1884, Hilaire Chardonnet, a French chemist, patented a synthetic fiber. ²This artificial fiber was the first one that could readily be used to make into usable and attractive cloth. ³Chardonnet called his invention artificial silk. ⁴Chardonnet's new material did have something of the look and feel of real silk, but calling anything artificial is not a good selling point for a product. ⁵In 1924, Chardonnet's fabric was given a new five-letter name by the manufacturer that it thought was more attractive. ⁶The first three letters were chosen because they formed a word thought to represent the fabric's shininess or beams of light. ⁷The last two letters in this five-letter word were added to remind you of a common natural fiber. Can you infer this new five-letter word?

Your conclusion: _____

Which sentences have the best evidence to support your conclusion? _____

COMMON BONDS

disinfectants	butterflies	amphibians	onions	beans
horse breeds	apples	classifications	climates	stimulants

Cross out the word that doesn't belong in each group and write the word from the choice box that is the common bond.

- navy, lima, kidney, heart _____
- Bartlett, Honey Crisp, Granny Smith, Macintosh _____
- chloride, peroxide, iodine, soda pop _____
- snake, salamander, toad, **newt** _____
- ajax, forewing, antenna, thorax _____
- subpolar, arid, subtropical, eastern _____
- Arabian, Appaloosa, Clydesdale, Merino _____
- carrot, red, white, yellow _____
- kingdom, order, family, mother _____
- caffeine, valium, amphetamines, ephedrine _____

YOU CALL THAT BIG?

Read the true story below, then make an inference based on the evidence in the story.

¹The largest living bird in the world is the ostrich. ²The ostrich may grow as tall as 8 feet and may weigh as much as 345 pounds. ³Another large bird was the moa of New Zealand, which is now extinct. ⁴The moa grew as tall as 10 feet, but weighed less than the ostrich. ⁵However, the largest of all birds is a bird that was native to the African island of Madagascar. ⁶This bird is also now extinct, but when it was alive, it weighed in at a whopping 1,000 pounds. ⁷This extinct bird gets its common name based on its sheer size. Can you infer what logical and appropriate name was given to these giant African birds?

Your conclusion: _____

Which sentence has the best evidence to support your conclusion? _____

THE TIMELINE GAME

Using the clues, cross out each wrong answer to match each scientist with his invention, and the year of the invention.

Agustus Siebe	Crawford Long	Charles Goodyear	Justus von Liebig
1832	1832	1832	1832
1839	1839	1839	1839
1840	1840	1840	1840
1842	1842	1842	1842
vulcanization	vulcanization	vulcanization	vulcanization
anesthesia	anesthesia	anesthesia	anesthesia
chloroform	chloroform	chloroform	chloroform
diving helmet	diving helmet	diving helmet	diving helmet

- Siebe and Long did not invent either vulcanization or chloroform.
- Vulcanization and chloroform were both invented before 1840.
- Von Liebig's invention was exactly seven years before vulcanization was invented, and the diving helmet was invented exactly two years before Long invented anesthesia.

Siebe _____

Long _____

Goodyear _____

von Liebig _____

CHOOSE THE RHEA MAN

Read the true story below, then make an inference based on the evidence in the story.

¹The rhea is a large, flightless South American bird that looks something like a small ostrich. ²It stands about five feet tall and weighs about fifty pounds. ³The rhea has a unique nesting system. ⁴During mating season, the male rhea will dig a hole in the ground and line it with grass. ⁵Once the nest is complete, the male rhea will then bring several female rheas to his nest one at a time. ⁶Each female rhea will spend only a short time at this nest before leaving to be led to another nest by another male rhea. Can you infer what the females are doing in the nest in that short amount of time before leaving for another nest?

Your conclusion: _____

Which sentence has the best evidence to support your conclusion? _____

THE TIMELINE GAME

Using the clues, cross out each wrong answer to match each scientist with his invention, and the year of the invention.

Edmund Cartwright	David Bushnell	Thomas Savery	Alois Senefelder
1698	1698	1698	1698
1776	1776	1776	1776
1785	1785	1785	1785
1796	1796	1796	1796
military submarine	military submarine	military submarine	military submarine
power loom	power loom	power loom	power loom
lithography	lithography	lithography	lithography
steam engine	steam engine	steam engine	steam engine

- Bushnell and Cartwright made their inventions nine years apart, and the submarine was invented exactly 20 years before lithography was invented.
- Cartwright did not invent the submarine, and Senefelder did not invent anything in 1698.
- The steam engine was invented first.

Cartwright _____

Bushnell _____

Savery _____

Senefelder _____

Page 37 Crocodile bird

Best evidence sentence(s): 3

<u>Davy</u>	<u>Newberry</u>	<u>Ure</u>	<u>Walker</u>
electric arc lamp	band saw	thermostat	friction match
1809	1808	1830	1827

EXPLANATION: Clue # 1 tells us that Davy and Newberry must be either 1808 or 1809, so 1827 and 1830 are crossed out under them; and 1808 and 1809 are crossed out under the other two names. Clue # 1 tells you Newberry must be 1808 and Ure must be 1830 to make them 22 years apart. This also then tells you that Davy must be 1809 and Walker must be 1827. Clue # 2 tells you that Davy invented the electric lamp, as 1809 is after one number and before two numbers and Newberry must be the band saw, as 1808 is the only number before 1809. Clue # 3 tells you Ure invented the thermostat in 1830 and Walker the friction match, in 1827.

Page 38 The cooler temperatures at the higher elevations cause the plants to grow more slowly and this slow growth adds to their flavor.

Best evidence sentence(s): 5

-54°F Wisconsin -51°F Michigan -40°F Missouri -36°F Indiana -35°F Illinois

EXPLANATION: The only two numbers that are exactly 5 apart would be -40°F for Missouri and -35°F for Illinois. The only two numbers 15 apart would be -51°F for Michigan and -36°F for Indiana. The only remaining number is -54°F for Wisconsin.

Page 39 Teeth are deciduous. Our baby teeth fall out and are replaced with permanent teeth.

Best evidence sentence(s): 3

Marguerite Perey	francium	France	1939
William Ramsay	helium	England	1886
Clemens Winkler	germanium	Germany	1895

EXPLANATION: Clue #1 tells you to cross out France, England, 1895, and 1939 under Winkler, and cross out Germany and 1886 under both Perey and Ramsay. Clue #2 tells you to cross out England and 1895 under Perey and cross out France and 1939 under Ramsay. This leaves England and 1895 as the answers for Ramsay. Clue #3 reveals the dates for the elements discovery: helium in 1895, germanium in 1886 and francium in 1939.

Page 40 Antarctic circle. Nothing else on earth can be 11,000 miles away.

Best evidence sentence(s): 7

McCormick
reaper
1834

Colt
revolver
1832

Niepce
photography
1827

Gorrie
refrigerator
1844

EXPLANATION: Clue #1 tells you that photography and the revolver were not invented in 1834 or 1844, and the refrigerator and reaper were not invented in 1827 or 1832. Clue #2 tells you that neither Samuel Colt nor John Gorrie invented photography or the reaper, and Samuel Colt's invention was not the first or last invention (1827 or 1844). Since clue #3 tells us that the refrigerator was the last invention (1844), we know that the reaper was the second to last invention (1834). Using this information and clue #2, we now know that photography was the first invention (1827), which leaves the revolver as the 2nd invention (1832), followed by the reaper (1834), and finally the refrigerator (1844). Since we know from clue #2 that Samuel Colt's invention was not the first or last, and it was not the reaper, we know that Colt invented the revolver (1832). Since Colt invented the revolver (1832), and clue #2 tells us that Gorrie did not invent the reaper or photography, then Gorrie invented the refrigerator (1844). Using this information and clue # 3 that tells us McCormick's invention came after Niepce's invention, we know that McCormick invented the reaper (1834), and Niepce invented photography (1827).

Page 41 Tiger lily

Best evidence sentence(s): 6

1st Gagarin

2nd Shephard

3rd Grissom

4th Titov

5th Glenn

EXPLANATION: Clue # 1 tells you Gagarin is 1st, Grissom and Shephard must be either 2nd or 3rd, and Glenn and Titov must be either 4th or 5th so all other possibilities under each name should be crossed out. Clue # 2 tells you Titov must be 4th so Glenn must be 5th and Grissom must be 3rd and Shephard is the only remaining answer for 2nd.

Page 42 Trap Door Spider, of course.

Best evidence sentence(s): 4

- | | |
|----------------------|----------------------|
| 1. sneeze - diseases | 6. month - seasons |
| 2. flower - rocks | 7. tomato - grasses |
| 3. air - fossils | 8. corn - nuts |
| 4. toast - dairy | 9. spoon - energy |
| 5. berry - grain | 10. diamond - metals |

Page 43 The trillium blooms in early spring at about the same time robins return.

Best evidence sentence(s): 4

Ritty
cash register
1879

Westinghouse
air brake
1869

Calahan
stock ticker
1867

Heyl
stapler
1877

60 feet whale	40 feet basking	25 feet white	20 feet thresher	15 feet hammerhead
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EXPLANATION: Clue # 1 depends on the fact the number 15 is the only number in the group that is one-fourth of another number, so the hammerhead must be 15, the whale shark must be 60, and 15 is three-fourths of 20, so the thresher must be 20. Clue # 2 has you add 15 to another number and the only number it can be added to and get a number in the chart is 25, so the white shark must be 25 and the basking shark must be 40.

Page 72 Nutcracker

Best evidence sentence(s): 4

- | | |
|------------------------------|--------------------------|
| 1. aorta - brain | 6. princess - male birds |
| 2. vitamin - antibiotics | 7. place - tides |
| 3. Sparta - time periods | 8. wheat - monkeys |
| 4. moth - larvae | 9. macaroni - egg |
| 5. seaweed - spiny creatures | 10. hill - animal groups |

Page 73 A waterfall

Best evidence sentence(s): 6

<u>Engelbart</u>	<u>Sasson</u>	<u>Damadian</u>	<u>Kwolek</u>
computer mouse	digital camera	MRI machine	Kevlar
1963	1975	1974	1971

EXPLANATION: Clue # 1 tells you to cross out the inventions mentioned under each name. Clue # 2 tells you to cross out 1963 under Sasson, 1975 under Kwolek, and computer mouse and MRI under Sasson, meaning he invented the digital camera. Clue # 3 tells you to cross out computer mouse under Kwolek, meaning she invented Kevlar, Engelbart invented the computer mouse, and Damadian invented the MRI machine. All the dates should fall into place as Kwolek had to be 1971, Engelbart had to be 1963 as the computer mouse was invented first and Damadian then had to be 1974.

Page 74 The pyramids of Egypt.

Best evidence sentence(s): 2 and 4

Debiere	actinium	France	1899
Oersted	aluminum	Denmark	1825
Stromeyer	cadmium	Germany	1817

EXPLANATION: Clue #3 tells you to cross out actinium and cadmium under Oersted and cross out aluminum under Debiere and Stromeyer. Clue #1 tells you that aluminum under Oersted must have been discovered in 1825. In clue #2, Oersted must be from Denmark

as the middle of the three discoveries. In clue #3, cross out 1899 under Stromeyer, revealing 1817 as his year and 1899 for Debiere. In clue 1# cross out cadmium under Debiere, revealing actinium for him and cadmium as the answer under Stromeyer. Clue #2 reveals the country of Germany for Stromeyer as Oersted made his discovery after him.

Page 75 Mosquito hawk.

Best evidence sentence(s): 4

Bauersfeld
geodesic dome
1923

Maiman
laser
1960

Hamilton
jet boat
1954

McNamara
credit card
1950

EXPLANATION: Clue # 1 tells you the year for each invention, but can't be used until you do clue # 2. Clue # 2 tells you the order for each invention if you take the time to follow each inventor. For instance, if Hamilton made his invention after Bauersfeld then Hamilton can't be 1923 and Bauersfeld can't be 1960, so those dates are crossed off under those two inventors. The next part of clue # 2 says Maiman made his invention after Hamilton and since Hamilton came after Bauersfeld then at least two dates are crossed off under Maiman as both Bauersfeld and Hamilton made inventions before Maiman. The final part of clue # 2 reveals McNamara as 1950 because he had to be **after Bauersfeld who must be 1923.**

Page 76 Rayon

Best evidence sentence(s): 6 and 7

- | | |
|-----------------------------|----------------------------|
| 1. heart - beans | 6. eastern - climates |
| 2. Bartlett - apples | 7. Merino - horses |
| 3. soda pop - disinfectants | 8. carrot - onions |
| 4. snake - amphibians | 9. mother - classification |
| 5. ajax - butterflies | 10. valium - stimulants |

Page 77 Rain tree

Best evidence sentence(s): 4

262,000 miles
Io

138,000 miles
Thebe

112,000 miles
Amalthea

80,000 miles
Adrastea

79,000 miles
Metis

EXPLANATION Go to the last part of clue # 2, where Io is farther from Jupiter than Thebe. Working back from there, you see Thebe is farther than 3 moons, making Thebe 138,000, and Io 262,000, because it is the only planet farther than Io. Using the same logic, you see Amalthea is farther than 2 other moons, making it 112,000 and so on.

EXPLANATION: CLUE # 1 allows you to cross out 1698 and 1796 under Bushnell and Cartwright and 1785 and 1776 under Savery and Senefelder. CLUE # 1 also tells you the submarine was invented in 1776 and lithography was invented in 1796. CLUE # 2 tells you to cross out submarine under Cartwright, meaning Bushnell had to invent the submarine in 1776 and Cartwright is the answer for 1785. Now you can cross out lithography under Cartwright. Clue # 2 also tells you to cross out 1698 under Senefelder, meaning Savery had to make his invention in 1698. Senefelder has to be lithography since his invention came 20 years after the submarine. CLUE # 3 allows you to deduce that the power loom belongs to Cartwright since the steam engine was invented first.

Page 88 Resurrection plant

Best evidence sentence(s): 2

- | | |
|-------------------------------|--------------------------------|
| 1. toe - hand | 6. horse - nocturnal creatures |
| 2. socks - offspring | 7. robin - nonflying birds |
| 3. diabetes - sleep disorders | 8. turnip - cabbages |
| 4. square - triangles | 9. anemia - skin disorders |
| 5. ulna - skull bones | 10. honey - wasps |

Page 89 Reindeer moss

Best evidence sentence(s): 3

1st California 2nd Oregon 3rd Texas 4th New York 5th Colorado

EXPLANATION: Cross out 1st and 5th under Oregon, as it grows more onions than at least one state and less than at least one state. Cross out 2nd under Texas, cross out 1st, 2nd, and 5th under New York, then 1st, 2nd, 3rd, and 4th under Colorado, making Colorado the answer for 5th and California the answer for 1st. Keep crossing out choices and New York is 4th, Texas 3rd, and Oregon is 2nd.

Page 90 Ice skating. Ice skaters actually skate on a thin film of water.

Best evidence sentence(s): 4

Acheson	Carborundum	United States	1884
Marconi	radiotelegraph	Italy	1895
Nyberg	blowtorch	Sweden	1882

EXPLANATION: Clue #1 tells you to cross out 1882 and Sweden under Acheson, as he made his invention after the man from Sweden and 1882 isn't after anything in the puzzle. In clue #2, cross out Sweden, the United States, 1882, and 1884 under Marconi, revealing Marconi was from Italy and made his invention in 1895. When you cross out Italy and 1895 under Acheson and Nyberg, then everyone's country and date of invention are revealed. Clue 3 tells you the blowtorch was invented first by Nyberg in 1882, so cross out blowtorch