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AND PRODUCTION TEAM  
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IN NORTH AMERICA AND  
THE UNITED KINGDOM.

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We work with a large number of authors, editors, designers, artists, picture researchers, and agencies and have the ability to join a project at any stage and take it through to completion on time and on budget.



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- Concept and content creation
- Trafficking complex projects
- Finding and commissioning authors
- Design and page make up
- Copy editing, proofreading, and indexing
- Image research and copyright clearance
- Commissioning and managing authors
- Preparation of product for print or online delivery
- Re-imagining and exploiting data resources



# UNCOVERING THE PAST

## TWENTY 48-PAGE TITLES FOR CRABTREE CANADA



### MODERN EXAMPLES

## HISTORY REPEATED

"We can say with certainty—we are stronger now than any potential aggressor. Anyone."

Russian President Vladimir Putin, 2016

Although the Cold War between the United States and the U.S.S.R. ended in the 1990s when both countries agreed to nuclear controls, tensions have been on the rise again in recent years. In December 2016 U.S. President-elect Donald Trump raised the world's attention when he tweeted, "The United States must greatly strengthen and expand its nuclear capability until such time as the world comes to its senses regarding nukes."

Trump later confirmed his stance that the United States would not sit by idly while other countries built up their arms. President Vladimir Putin of Russia said that he was not surprised by Trump's statements. After taking office as president, Trump continued to assert that he would support a renewed Arms Race.

In the last 20 years or so, other nations around the world have developed nuclear weapons as a way to assert their power and deter potential enemy threats. Only five countries are legally allowed to have nuclear weapons—the United States, Great Britain, Russia, France, and China. To date, nine countries have access to nuclear arms, including Pakistan, India, Israel, and North Korea. Most only have a few dozen to a few hundred nuclear weapons in their arsenal. The United States and Russia maintain about 90 percent of the global supply, with more than 7,000 each. Five European nations have allowed the United States to place nuclear weapons on their soil, and about 24 other nations rely on U.S. nuclear arms for security.

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▼ On January 6, 2016, a newspaper in Tokyo, Japan, had a photo of North Korean leader Kim JongUn announcing his country had performed its first hydrogen bomb test.

### PERSPECTIVES

Why do you think people in Japan would want to know about hydrogen bomb tests in North Korea? Why do you think the headline is so large? How might the newspaper article have made readers feel? What might North Korean newspapers have said?

NUCLEAR WEAPONS AND THE ARMS RACE 39

time of the harshest rally can send you in for police to abuse simply mention tested and deported. He have virtually no under women in Turkey or while in custody, in all-time high, are routinely shut out, and deep been attacked and on the government or nation or hate crimes. be strongly anti-still illegal. Violence or New laws passed referring to LGBTQ eye also been banned get citizens arrested. made, a change in, in the United y of the new orders LGBTQ community. It stage illegal again, transgender and ple from all parts of strong chance that it'll be ended again.

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### ANALYZE THIS

Think of the countries where gay rights are under attack or non-existent. What are basic human rights like in these same countries? Is there a link between lower human rights and lack of LGBTQ rights? If so, what is the link?

▲ The Women's March on January 21, 2017 was a worldwide protest. Women demanded change to policies around women's rights, immigration reform, healthcare, and LGBTQ rights.

► Athletes have been out in sports for many years but soccer player Robbie Rogers is the first openly gay male athlete in any of the major North American sports leagues.

### DIFFERENT VIEWS

## AT HOME AND ABROAD

"Let us cross over the river, and rest under the shade of the trees."

"Snowfl" Jackson's last words

The Civil War affected all the nation. On April 14, 1865, President Lincoln was assassinated by John Wilkes Booth. Lincoln died the next day. Booth escaped to Virginia after the shooting but was shot and killed by a Union soldier 11 days later. The final battle of the Civil War happened less than a month later, on May 13, at Palmito Ranch, Texas.

Even though California and Oregon were across the country from most of the Civil War action, they still had a role to play. In September 1861, a senator from Oregon was sent to Philadelphia to fund and command the California Brigade. The brigade joined the fight against the Confederacy. Other Eastern-born Californians also joined forces and headed east to join the fight. The California Column, a group of 5,000 Union volunteers, marched 900 miles (1,448 km) to Texas in order to keep Confederate soldiers out of Arizona Territory and remove them from New Mexico. This was key to keeping the South from gaining support and strength in the west.

Back in California, the state's gold resources were important for the Union. The Confederacy could have benefited from the gold and access to ports unaffected by the Union blockade. A small number of Southerners who moved to the state during the 1848-1857 gold rush were vocal about having Southern California secede from the Union. In 1864, Confederate Captain Rufus Ingram began recruiting Southern Californians to join him in robbing stagecoaches. The money they took was used to fund the Confederate cause. The state definitely felt the impact of the war and it took many years for divisions to heal.

► This lithograph is a secondary source showing the artist's interpretation of the assassination of Abraham Lincoln by John Wilkes Booth.

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THE CIVIL WAR 33



# QUIZ WHIZ

THREE 176-PAGE FACT BOOKS FOR NATIONAL GEOGRAPHIC PARTNERS

## SIMPLE MACHINES

1 The **see-saw** is an example of which type of machine?  
a. lever b. pulley c. crank d. motor

2 Which isn't considered a **simple** machine?  
a. wheel and axle b. inclined plane c. screw d. electrical circuit

3 Which **tool** uses a **wedge** to force things apart?  
a. ax b. drill c. staple gun d. ladder

4 A **ratchet** **\_\_\_\_\_**.  
a. makes a giant explosion b. lifts things up c. lets a wheel turn in only one direction d. transmits electricity

5 **True or false?** Adding more pulleys to a rope system makes it easier to lift **heavy loads**.  
a. screw b. hammer c. tape measure d. saw

6 Which **tool** is made of an inclined plane **wrapped** into a spiral shape?  
a. screw b. hammer c. tape measure d. saw

7 Which **simple machine** can you find on a **bicycle**?  
a. lever b. pulley c. wheel and axle d. all of the above

8 Which **household object** doesn't use any **simple machine**?  
a. light bulb b. scissors c. pillow d. door knob

9 **True or false?** A wheelbarrow is an **example** of a compound machine.  
a. light bulb b. scissors c. pillow d. door knob

10 **Archimedes** once said: "Give me a place to stand and with a **\_\_\_\_\_** I will move the whole world."  
a. lever b. ramp c. wheel d. rocket ship

11 A **lever** **rotates** around a **\_\_\_\_\_**.  
a. ball bearing b. gear c. fulcrum d. spool

12 **True or false?** A car has exactly four wheel-and-axle systems.  
a. pulley b. wedge c. screw d. pulley

13 Which **simple machine** would **help** you **raise** the sails on a boat?  
a. pulley b. wedge c. screw d. pulley

14 Your **front teeth** are an example of which machine?  
a. pulley b. wedge c. screw d. pulley

CHECK YOUR ANSWERS ON PAGE 164

## QUIZ WHIZ 4

1,000 SUPER FUN MIND-BENDING TOTALLY AWESOME TRIVIA QUESTIONS

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a. lever b. pulley c. wheel and axle d. all of the above

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## GIRL POWER

1 How old was **Queen Elizabeth I** when she became ruler of England?  
a. 19 b. 25 c. 30 d. 35

2 **True or false?** Sacajewea brought her infant **SON** along on Lewis and Clark's 1804-1806 expedition to the American West.  
a. Bessie b. Sacajewea c. Sacajewea d. Sacajewea

3 **Frida Kahlo** was a Mexican artist and feminist who survived both polio and a terrible bus accident. What type of **art** did she make?  
a. self-portraits b. sculptures c. abstract drawings d. woodcut prints

4 In 1963, who became the first **woman** to travel into space?  
a. Sally Ride, U.S.A. b. Valentina Tereshkova, Russia c. Helen Sargant, U.S.A. d. Svetlana Savitskaya, Russia

5 In 1966, **Indira Gandhi** became the country's first female leader and prime minister.  
a. Bessie b. Sacajewea c. Sacajewea d. Sacajewea

6 Who was the first woman on the **U.S. Supreme Court**?  
a. Sandra Day O'Connor b. Ruth Bader Ginsburg c. Sonia Sotomayor d. Hillary Clinton

7 In 2012, a Pakistani girl named **Malala Yousafzai** was attacked because she had spoken out in support of her right to **\_\_\_\_\_**.  
a. healthcare b. an education c. wear pants d. all of the above

8 In 1428, Joan of Arc led the French Army to **victory** at the Battle of Toulouse.  
a. Elizabeth b. Clara B. c. Clara B. d. Clara B.

9 **True or false?** In the **empire**, laws for **rights** in **\_\_\_\_\_**.  
a. No. Dorian, China b. Lucilla, Rome c. Lucilla, Rome d. Lucilla, Rome

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CHECK YOUR ANSWERS ON PAGE 164

## Pay DAY!

1 What is the annual salary of the **President of the United States**?  
a. \$100,000 b. \$400,000 c. \$500,000 d. \$1,000,000

2 What is the average salary for a **computer programmer** in the United States?  
a. \$43,200 b. \$45,400 c. \$47,300 d. \$48,900

3 For 2014, the world's highest paid athlete was **\_\_\_\_\_**. How much did he earn?  
a. \$100,000,000 b. \$100,000,000 c. \$100,000,000 d. \$100,000,000

4 **True or false?** The world's top paid athlete in 2014, earning \$100,000,000, was **\_\_\_\_\_**.  
a. Qatar b. United States c. Japan d. Canada

5 In 2014, **\$48.433** was the highest average amount earned per person in which country?  
a. Qatar b. United States c. Japan d. Canada

6 **True or false?** The world's top paid athlete in 2014, earning \$100,000,000, was **\_\_\_\_\_**.  
a. Qatar b. United States c. Japan d. Canada

7 In 2014, the city with most billionaires in the world was **\_\_\_\_\_**.  
a. New York, New York, U.S.A. b. Moscow, Russia c. London, England d. Hong Kong, China

8 This item, which makes up about 55 percent of the ocean, is where we get the word "salary" from.  
a. salt b. shells c. sand d. seaweed

9 As of 2014, heads of Apple, Facebook, Google, and other technology companies all receive the same salary of **\_\_\_\_\_**.  
a. \$1 a year b. \$1 million a year c. \$1 billion a year d. \$1 trillion a year

10 **True or false?** Harvey Keitel, who plays Iron Man, was named Hollywood's highest paid actor for 2014.  
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CHECK YOUR ANSWERS ON PAGE 165

## Bird WATCH

1 What is the name of this stunning bird from the Central American tropical rain forest?  
a. watermelon bird b. good-looking chick c. resplendent quetzal d. Zeus

2 Like the baseball team, male Baltimore Orioles have **\_\_\_\_\_** coloring.  
a. blue and gray b. bright orange and black c. yellow d. green and purple

3 What does a Turkey vulture do to defend itself?  
a. uses wings spikes to prick predators b. throws up smelly vomit c. shoots poison feathers d. burrows into the ground

4 **True or false?** In most bird species, the male is more colorful than the female.  
a. uses wings spikes to prick predators b. throws up smelly vomit c. shoots poison feathers d. burrows into the ground

5 **True or false?** Baby hornbills and their mother live inside a tree for about four months.  
a. uses wings spikes to prick predators b. throws up smelly vomit c. shoots poison feathers d. burrows into the ground

6 Which fruit is also the name of a New Zealand bird?  
a. papaya b. banana c. mango d. kiwi

7 Where does the toucan live?  
a. Asia b. Africa c. South America d. Europe

8 In which habitat would you find the greatest variety of bird species living together?  
a. a pine forest b. the suburbs c. a city d. the tropical rain forest

9 Which bird, flying from Antarctica to Greenland, holds the record for the longest migration of any animal?  
a. arctic tern b. swallow c. sparrow d. grouse

10 **True or false?** Human fighter pilots reach their top speeds faster than cliff swallows can.  
a. arctic tern b. swallow c. sparrow d. grouse

11 Birds of paradise of Papua New Guinea have uniquely shaped feathers that they use **\_\_\_\_\_**.  
a. to attract mates b. to regulate their body temperature c. to help them fly d. all of the above

12 Which of these birds can't fly?  
a. condor b. falcon c. cassowary d. pelican

CHECK YOUR ANSWERS ON PAGES 159-166



# ISLAM

SIX 48-PAGE TITLES FOR CRABTREE CANADA



# MYTHOLOGY

EIGHT 48-PAGE TITLES FOR CRABTREE CANADA









# WAR OF 1812

FOUR 48-PAGE TITLES FOR CRABTREE CANADA



# DINOSAURS 3D

80-PAGE 3D BOOK FOR TIME FOR KIDS









# ULTIMATE ADVENTURE ATLAS OF EARTH

160-PAGE ATLAS FOR NATIONAL GEOGRAPHIC PARTNERS

## AWESOME ANIMALS

### Extreme and EXOTIC

**ANIMALS**



**5 COOL ANIMALS TO SEE HERE**

**MAP KEY**

- Koala
- Red Kangaroo
- Inland Taipan
- Long-beaked Echidna
- Tasmanian Devil

**1 GIANT CRAB**  
Solomon Islands  
Coconut crabs are the biggest shelled, jointed-legged animals on land. They can grow up to 3 feet (91 cm) across and weigh 9 pounds (4.1 kg). The crab's favorite food is coconut. It breaks open the tough husks with its massive pincers.

**2 RIVER RAPIDS**  
Page 34  
In some places, the Colorado River is playful and calm. In other places, it is rough and wild. Ride the river in an inflatable raft and expect any kind of camp along the way as you spend 3 to 14 days on the river.

**3 NARROW CANYON PATH**  
Angels Landing  
Saddle up a mule and let it transport you down Bright Angel Trail. Catch some breath-taking views of the Colorado River. Stay to sleep under the stars, and head back up at sunrise.

**4 COOL PLACES TO SEE HERE**  
This 3D map of the Grand Canyon highlights the massive, twisting, river-cut, channel through the southwestern U.S. Along the canyon are narrow gorges, waterfalls, and steep, rocky cliffs. Hike, canoe, kayak, or take a mule ride. Choose of rock climbing, extreme riding, horseback riding, or white-water rafting.

**5 PATCHWORK PLATYPUS**  
Australia  
The egg-laying platypus looks like it was patched together from other animals. It has a bill and webbed feet like a duck, a body like a beaver, and a tail like a fish.

**DID YOU KNOW?**  
The box jellyfish is the most venomous marine animal known. Its powerful stinging stuns or kills prey instantly. Each tentacle can reach to feet (1 m) in length and is covered with about 5,000 stinging cells.

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## GRAND CANYON

### Six million years IN THE MAKING

**ON LOCATION**

More than 275 miles (443 km) long, up to 18 miles (29 km) wide, and in places 1 mile (1.6 km) deep, this steep-sided canyon cuts through the Arizona landscape in the United States. Over millions of years, the Colorado River eroded the underlying rock and continues to run through the canyon. Weather conditions are always changing depending on the season, location, and depth of the canyon. There are droughts, flash floods, thunderstorms, and even snowfalls and frost.

**1 COLORED WATERFALL**  
Havas Falls  
Brace yourself for the cold and colorful splash of the Havasu Falls. Calcium carbonate and magnesium in the water create the blue-green color. Camp overnight near the falls and hike from one refreshing pool to the next.

**2 DIGITAL TRAVELER!**  
The Eliseireswell in Austria is the largest ice cave in the world. Glittering ice formations fill the 26-mile (42-km) long labyrinth.

**3 TORNADO TORRENT**  
United Kingdom  
Each year the United Kingdom is hit by more than 50 tornadoes. Rarely are they severe but they give the country the highest rate of twisters for its land area of any country in the world.

**4 HORRENDOUS HEAT**  
Greece  
Summer time in Greece is always hot. In 1977 a heat wave baked the city of Athens and the nearby town of Elefsina, bringing temperatures to a boiling 128.7°F (53.7°C). Sweaty residents cooled off in swimming pools and at the beach.

**5 SHIVERING COLD**  
Russia  
Experience bitter cold in the Ural Mountains. Near the village of Ust-Shtupor, on December 15, 1978, the temperature dropped to -72.6°F (-58.5°C)—the lowest ever recorded in Europe.

**DIGITAL TRAVELER!**  
In 2014, hikers across of Moldova, Albania, and Romania were buried under 15 feet (4.6 m) of snow. Search the Internet to see photos of the shivering, shovel-worthy snowfall.

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## EXTREME WEATHER

### Scorching heat to deep SNOW

**CLIMATES**

**1 HUMONGOUS HAIL**  
Germany  
Catastrophic hailstorms are not uncommon in Munich. In 1964, hail the size of baseballs damaged about 70,000 homes in the city, along with 100 aircraft. The damage was estimated at more than \$2 billion.

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**STRANGE BUT TRUE**  
In the summer of 1815, days were so overcast that many farmers in Europe lost their crops. The gloomy "Year without a Summer" was later traced to an 1815 volcanic eruption. Thick dust from the eruption had blocked sunlight.

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## Ultimate Adventure Atlas of Earth

**NATIONAL GEOGRAPHIC KIDS**

**MAPS • GAMES • ACTIVITIES**  
and more for hours of extreme fun!

**1 GHOSTLY SPECTRE**  
Scotland  
Climb through the mist in the Scottish Highlands and you may see the ghostly figure of the Brocken spectre. This optical illusion is your shadow cast on the clouds and mists, surrounded by a rainbow of light.

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# ULTIMATE GLOBETROTTING WORLD ATLAS

160-PAGE ATLAS FOR NATIONAL GEOGRAPHIC PARTNERS

## MICRONESIA

### Sunny Island PARADISE

#### 3 WALK A PATH OF STONE MONEY

Imagine using a stone the size of a car to buy food or a canoe trip. Long ago, stones with holes in the middle served as money. People did not move the largest stones. They just claimed ownership.



#### ID CARD COUNTRY FACTS

<b>FEDERATED STATES OF MICRONESIA</b>	
Population: 107,000	
Capital: Palikir	
<b>KIRIBATI</b>	
Population: 106,000	
Capital: Tarawa	
<b>MARSHALL ISLANDS</b>	
Population: 56,000	
Capital: Majuro	
<b>NAURU</b>	
Population: 11,000	
Capital: Yaren	
<b>PALAU</b>	
Population: 21,000	
Capital: Melekeok	



#### NGARDMAU WATERFALLS

In the Ngardmau district of Palau, hikers reach the tallest and biggest waterfall—the Tlo Falls—by wading a path of old railroad tracks through the jungle.

#### ALELE MUSEUM AND LIBRARY

Here in the Marshall Islands, a collection of stick charts shows off traditional technology. Made from coconut leaves, these 3D charts helped islanders memorize wave patterns so they could canoe the ocean safely.

#### KIRIBATI

#### 4 REPORT ON A CANOE RACE

#### 5 COOL THINGS TO DO HERE

#### 1 SING WITH COWBOYS

Stop in a restaurant and listen to marshalls singing their favorite tunes. They dress like cowboys (cowboys) but with fancier clothes.



#### COPPER CANYON

This group of canyons is larger than the Grand Canyon in the U.S.A., and parts of it are deeper. You can hike, drive, or ride a horse through the scenery. Or you can ride a train. The Copper Canyon Railroad travels through cliff walls and over 36 bridges.

#### THE ARCH

At the tip of the Baja Peninsula, the Pacific Ocean meets the Sea of Cortez. Here a stunning natural rock formation serves as a window to the blue waters of the ocean.

#### 5 COOL THINGS TO DO HERE

#### 1 READ CARVED STORY BOARDS

Ask woodcarvers to tell you their stories as they carve pictures in wood. Story boards tell ancient legends about Palau.



## MEXICO

### From Mayan Ruins to Mariachi PARADES

Mexico is a large country just south of the United States. Its capital, Mexico City, is one of the world's largest cities in population. You can see signs of Mexico's long civilizations. Today cities left by Mayan and Aztec peoples and the Spanish people who set up a colony there in the 1500s. The beaches on the Pacific Ocean and the Gulf of Mexico are popular vacation destinations.

#### ID CARD COUNTRY FACTS

<b>MEXICO</b>	
Size: 758,449 sq mi (9,964,375 sq km)	
Population: 121,538,000	
Capital: Mexico City	
Official language: Spanish	
Currency: Mexican peso	
Highest point: Volcan Pico de Orizaba, 18,406 ft (5,610 m)	
Life expectancy: 75.9 years	

#### 2 COUNT BUTTERFLIES

Every year, more than a million monarch butterflies arrive here to spend the winter. They come from as far away as eastern Canada. Each day at noon you can see swarms of them heading to the river to quench their thirst.



#### 3 CLAP FOR CLIFF DIVERS

Hold your breath as you watch these trained divers plunge 136 ft (41 m) into the Pacific Ocean. They must watch the waves and dive when the water is deepest.



#### 4 CLIMB A PYRAMID

Take lots of photos of this ancient city built between the first and seventh centuries. Teotihuacan was a holy city with pyramids all along the Avenue of the Dead.



#### 4 EXPLORE "NEW FRANCE"

With its castle-like hotel, Chateau Frontenac, this is the capital of French-speaking Canada. Be sure to explore the Ramparts, the only remains of a protective city wall in North America.



## CANADA

### The Land of Snow and ICE

Canada is the second-largest country in area in the world, after Russia. At 5,525 miles (8,892 km) from west to east, it stretches nearly a quarter of the way around the globe. This huge country contains some of the world's most spectacular and wildest scenery. In the far north are giant frozen islands of the Arctic Ocean. To the south are the Great Lakes, the largest group of freshwater lakes in the world.

#### ID CARD COUNTRY FACTS

<b>CANADA</b>	
Size: 5,525,122 sq mi (9,984,670 sq km)	
Population: 35,350,000	
Capital: Ottawa	
Official languages: English and French	
Currency: Canadian dollar	
Highest point: Mount Logan, 19,501 ft (5,955 m)	
Life expectancy: 81.6 years	



#### NIAGARA FALLS

About 3,160 tons (2,867 mt) of water flow over Niagara Falls every second. The falls have the capacity to produce electricity for 3 million homes in Canada and the United States.

#### CN TOWER

Toronto's 1,815-ft (553-m)-high telecommunications and viewing tower is the tallest structure in North America.

#### WHISTLER AND BLACKCOMB

These stunning mountains hosted the 2010 Winter Olympics. They are often snowcapped all year long.

#### DIGITAL TRAVELER!

In eastern Canada, road signs use French and English. On your computer, make a two-column chart of English and French travel words for your trip.





# 1000 FACTS

96-PAGE FACT BOOKS FOR NATIONAL GEOGRAPHIC PARTNERS

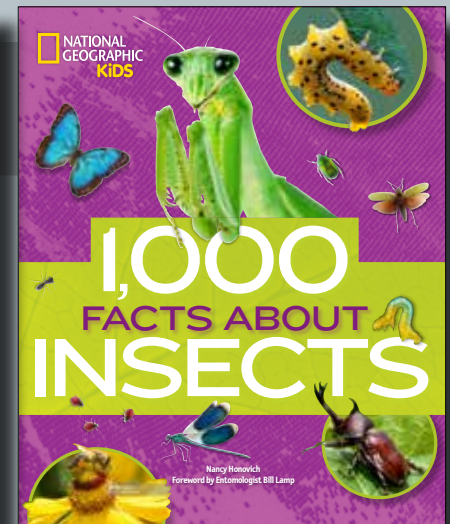
1 There are about **1,000,000** known insect species in the world.

2 Scientists suspect that up to **30 MILLION** insect species have **YET TO BE DISCOVERED**.

3 About **85,000** of all known insects are **TRUE BUGS**. They include **STINK BUGS, GIANT WATER BUGS, and BEDBUGS**.

4 THERE ARE **825 KNOWN** tick species. SOME TICKS CAN SURVIVE AS LONG AS **200 DAYS** without food or water.

5 With at least **90,000** insect species, BRAZIL has more insect diversity than anywhere else in the world.



6 Americans share their homes with more than **500** species of **arthropods** at a given time. These include cockroaches, moths, and...

7 More than **2,000** FLEA species have been identified. Fortunately for Fido, only a few of these species **ATTACK**...

1 Ants are **social** insects. They live together in groups called **colonies**.

2 An ant **queen** produces eggs, while ants make with the queen, and female workers provide food and protect the colony.

3 Yellow crazy ants can form supercolonies that contain **millions** of queens.

4 In 2001, a supercolony of billions of yellow crazy ants was found on Christmas Island.

5 Ants can be found on **every continent** on Earth except Antarctica.

6 Scientists estimate that ants have been around for about **130 million** years.

7 Waste produced by ants—as well as other insects—is called **frass**.

8 Black garden ants don't leave their waste lying around. Instead, they move it to "toilet" areas in the nest.

9 A trap-jaw ant can spit its jaws a leg mile in its hour (33 km/h). That's more than **200 times** faster than a human eye blink.

10 Turtle ant soldiers use their heads to block their entrances to their nests. This helps defend the nest from intruders.

11 An Asian weaver ant was recorded holding a 500-mg (about 0.0022 ounce) weight that's 500 times the ant's body weight.

12 Carpenter ants use their mandibles to chew holes into wood. They build their nests inside these holes.

13 Workers ants of the garden ant species are so tiny they can be seen only with a microscope.

14 One of the largest known ant species is the giant forest ant. Adults can reach heights of **3.2 inches** (80 mm).

15 Weaver ants create **rafts** in trees located in Africa, Asia, and Australia.

16 Weaver ants use a sticky substance called **serotonin** to seal ant holes together.

17 During a South Carolina U.S.A. event, ants were seen making their legs and mouthparts together to form a **raft**.

18 Although a male black garden ant lives for only a few weeks, the queen can live up to **30 years**.

19 A team of U.S. scientists is creating a website called **AntNet**. That website will feature 3-D images of **known ant species**.

20 Some ants of the genus *Pheidole* inject their larvae with a hormone that turns them into giant super soldiers to defend the colony.

21 As leafcutter ants travel through a forest, they leave behind a **scenic trail**. This helps the ants keep track of their path.

22 The ant *Formicosa longipennis* can recognize its enemies—particularly those that threaten the lives of its colony members.

23 When an Asian needle ant finds a sack that's too large to carry, it returns to its nest to grab a worker ant to help move the load.

24 An ant queen can lay up to **300,000** eggs in a span of **few days**.

25 Lemon ants, which live in the Amazon rain forest, will build nests only in trees of the species *Duroia hirsuta*.

26 Because the ants drive their larvae inside on the burning inside, all other tree species and insects that try to feed from them.

27 When *Formicosa longipennis* ants get **lost**, they leave their nests to find their way.

28 To protect their queen, workers of the army ant *Eciton burchelli* will interlock their bodies to create a **shield**.

29 The shelters created by eciton burrowing ants consist of up to **700,000** ants and can measure **three feet (0.9 m)** across.

30 Ants of the genus *Myrmica* have been known to climb on top of dead-harvester ants to lick their bodies and mouthparts clean.

31 After acacia ants eat nectar from Central America's acacia trees, they become forever unable to digest nectar from any other tree species.

32 In exchange for the nectar, the acacia ants will defend on trees from other animals and insects that try to feed from them.

33 Ant species *Leptothorax longipennis* were newly discovered after it was found by a trap-jaw ant. The ant has **forceps-like mandibles** for grasping prey.

34 Leafcutter ants feed on a fungus. As the fungus grows, the ants change jobs and carry leaves cut by younger ants.

35 In Europe, a supercolony of Argentine ants spans almost 3,700 miles (6,000 km). The colony extends through Italy, France, Spain, and Portugal.

36 *Simulium obliquum* ants can't make **sound** while on the move. They must **plan their movements** before setting off.

37 As for decisions about a new home, colonies of these ants decide as a group which **crack crevice** to move into.

38 To fend off predators, the *Stenamma* ants **bury** their colony that lead to empty nests.

39 If a predator approaches the trail, **nest** of *Stenamma* ants, the little insects will **roll** the way away with a **pebble**.

40 The razor-sharp jaws of leafcutter ants become dull with age. When this happens, they **change jobs** and carry leaves cut by younger ants.

41 *Gigaproctus destructor*—a species of jumping ant in South America—can swim at a speed of **3.3 inches a second** (8.5 cm/s).

42 An *Ophiorhynchus* fungus in **land** and **sea** not only **infects** carpenter ants, but it takes over the ants' **mind**—making them act like **zombies**.

43 The fungus *Ophiorhynchus* **unilaterally** forces the ants to move to an area where the fungus can **reproduce**.

44 When an ant gets too close to its food, the ant **spits** a **drop** of **saliva** in New Zealand grass. The ant **spits** away with it, then **drinks** it.

45 When food is scarce, blooded honeybees **vent** their **stomach** nectar. The nectar is **eaten** by workers in the colony.

46 Some honeybees can **gorge** on nectar until their **stomach** is **three** times the size of their **body**.

47 Scientists estimate that colonies of *Trachymyrmex septentrionalis* ants weigh **1.764 pounds** (800 kg) of soil each year.

48 Australian meat ants recognize each other by **color** and **chemical** signals. They use their **antennae**.

49 The world's largest ant farm, in Singapore, is the size of a **small** bad **meat**.

50 A *Formicosa* ant has **pitchfork-like** mandibles. During an attack, the ant can **inject** its mandibles to form a **face guard**.

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1 President Thomas Jefferson had an ice house built on the White House grounds so that he could have ice cream all year long.

2 While Jefferson was the first president to have ice cream in the White House, Dolley Madison later made it famous at the house by regularly serving it at her dinner parties.

3 First Lady Madison plucked small, sweet oysters from the Potomac River to create her favorite ice cream flavor—oyster.

4 Part of the ground houses have often been lit with lighting to illuminate their tiny individual rooms.

5 A highly trained Secret Service agent chauffeurs the presidential limousine, which is able to launch tear gas if under attack.

6 Agents also guard the vice president, their families, and former presidents and first ladies.

7 A member of the U.S. Secret Service with a police dog patrol in front of the White House.

8 Allergic to chocolate, President Bill Clinton safely satisfied his sweet tooth with carrot cake.

9 First Lady Mamie Eisenhower's famed "Million Dollar Fudge" recipe is still popular some 60 years after she left the White House.

10 Fishing boat dessert created by a White House pastry chef.

1 U.S. Secret Service agents use code names for presidents and first ladies: the "Rainbow" for Ronald and Nancy Reagan and "Trillium" for George W. Bush.

2 In 2005, a four-year-old child climbed under a temporary barrier in front of the White House, causing the Secret Service to shut down the mansion for a few moments.

3 The fence surrounding the White House is topped with super-sharp steel spikes to keep intruders out.

4 On official journeys, Secret Service close protection vehicles are fitted with the U.S. flag and presidential seals.

5 Secret Service agents must go through several months of specialized training, including first aid, criminal law, and psychology.

6 In 1978, an agent rescued first daughter Amy Carter from the path of a charging circus elephant.



## Neutron stars and black HOLES

# CIRCLING COMETS

## “Hairy” stars visitin from outer SPACE

Comet Lovejoy

**2 BUMPY LANDING**  
Philae spacecraft

Ice screws, anchoring harpoons, and a down-pushing thruster should have kept the lander Philae on comet 67P/Churyumov-Gerasimenko's low-gravity surface. But Philae bounced—about 3,300 feet (1,006 m) high! It then soared, spun, and tumbled above the comet for two hours before finally settling down.

**HEAD TO TAIL**  
The frozen core of a comet is its nucleus. Near the warming sun, its frozen ices vaporize, their gases surrounding the nucleus in a reflective, halo-like atmosphere—the coma. Some escaping gases and loosened dust are also pushed back by the solar wind. This creates the comet's tail (actually two separate tails). The lightweight hydrogen envelopes the coma and tail, and can stretch for millions of miles.

100

## A CRAB'S PULSING HEART

Within the constellation Taurus lies the Crab Nebula, the remnant of a supernova witnessed in 1054. Inside that hides a pulsar, which is a spinning neutron star emitting a constant beam of radio waves that sweeps toward Earth with each spin. Detected on Earth, the radio signal pulses regularly.

#### 4 THE CRAB NEBULA IN X-RAY

A glowing globe of X-rays in this image pinpoints the pulsar at the heart of the Crab Nebula. The pulsar hurls high-energy particles that slam into material one-half light-year away. This makes the material light up in X-rays. Meanwhile, particles caught up in the star's extreme magnetism are thrust outward, appearing as jets streaming from the poles of the star.

## COOL FACTS TO RECORD

**COSMIC COMET CONNECTIONS**

Did comets play a starring role in the rise of life on Earth? Over eons, these water-rich bodies may have crashed to a new Earth, contributing up to one tenth of Earth's current water. Comets also carry substances related to life. For example, recently visited comet 67P/Churyumov-Gerasimenko contains sulphur, alcohols, ammonia, and methane.

## SPACE TRAVEL ATTRACTIONS

**DON'T WAIT UP**  
In 1996 Comet M... ..

# A VOLCANIC WORLD

## A greenhouse ATMOSPHERE

**F**rom far away, Venus seems like Earth, with similar size, orbit, and mass. After piercing the thick cloud cover, we see a very different world. Venus's atmosphere filters sunlight in a way that tints everything red. Even rocks that would look gray on Earth look ruddy. Full of

carbon dioxide, the atmosphere also traps heat.

This greenhouse gas, released from volcanoes, contributes to Venus's punishing temperature and bone-dry surface. It's thought that, long ago, rising temperatures dried oceans on Venus as backyard puddles evaporate on Earth at high noon, leaving behind a waterless, volcanic landscape.

## 2 DOOMED LANDERS

Many spacecraft that have attempted to land on Venus have crashed, been crushed, or burned. When the Soviet Venera 7 survived, it became the first craft to send data from the surface. Even successful missions have been doomed, lasting only a few short hours in Venus's high-pressure atmosphere and

## COOL FACTS TO RECORD

## 1 THE INSIDE STORY

If you shrank Venus to the size of a Ping-Pong ball, its core would be marble-size. The rest of the ball would be the mantle, and the crust would be about as thick as one or two coats of paint on the surface.



Venus's craters are not as noteworthy. It lacks small craters because small meteorites that would create them burn up in Venus's extra-thick atmosphere. It also has fewer large craters than expected, probably because newer lava has replaced an older surface.



**DID YOU KNOW?**

Venus has helped scientists explore Mercury. Beginning with Mariner 10, spacecraft have used Venus's gravitational force to help fling them toward the innermost planet. Mariner 10 was the first ship to use a gravity assist maneuver, a technique that many science fiction pilots have mastered.



MAGELLAN ORBITER

Safe from Venus's harsh conditions, orbiters such as NASA's Magellan fare better than landers. Between 1990 and 1994, Magellan's cloud-piercing radar and high-resolution imaging allowed it to map more than 98 percent of Venus's surface, revealing important geological details.

## BLOBS FROM BELOW

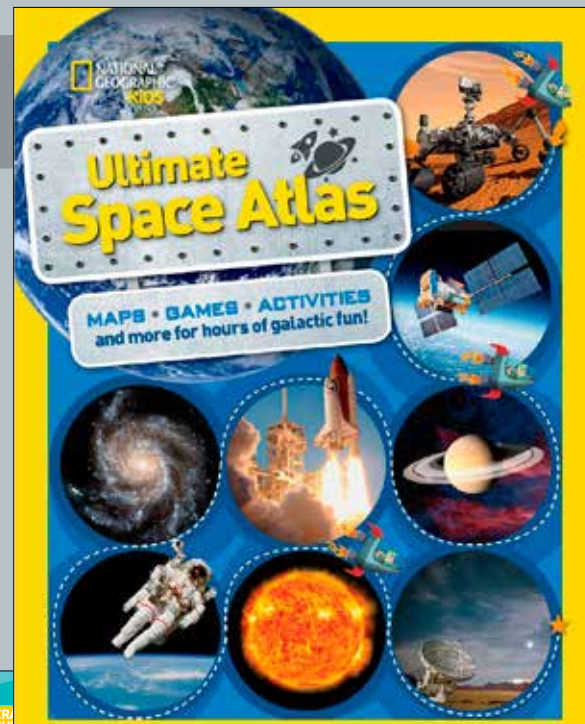
Pancake shapes called domes probably formed when extra-thick lava rose from under the level ground, spread like gooey batter into an even layer, and then cooled.

## WINNER SOLAR SYSTEM

46

## VENUS

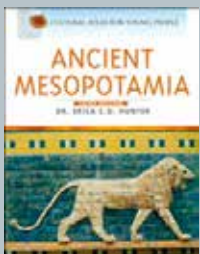
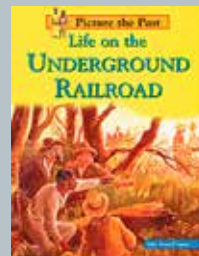
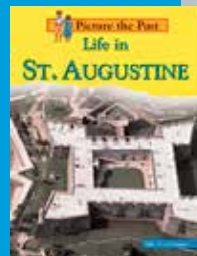
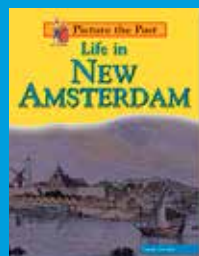
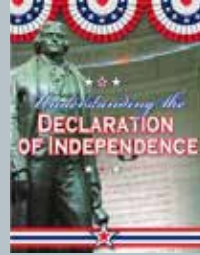
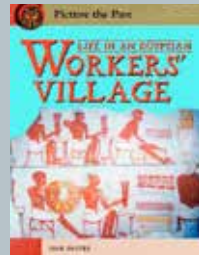
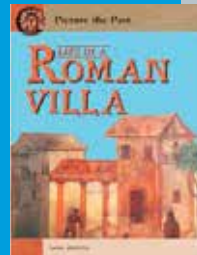
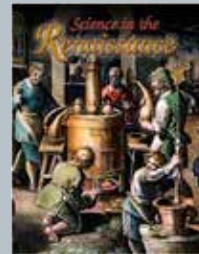
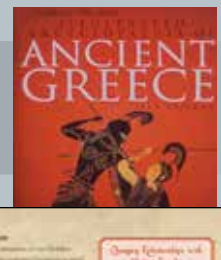
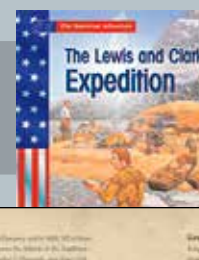
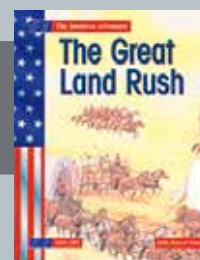
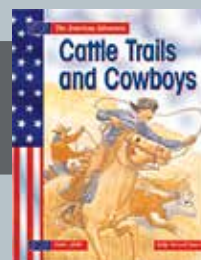
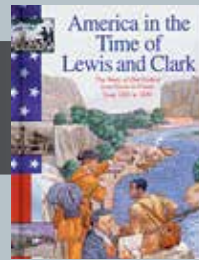
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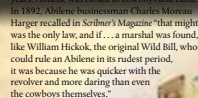


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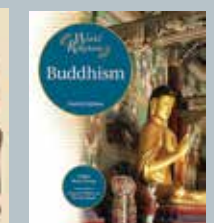
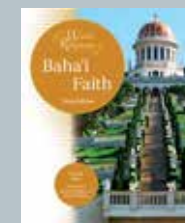
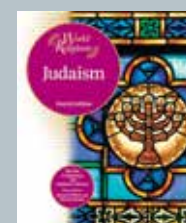
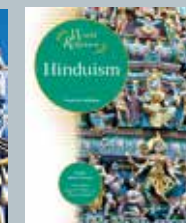
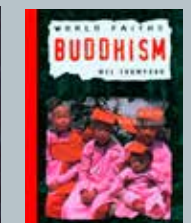
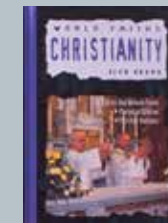
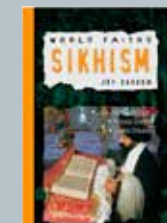
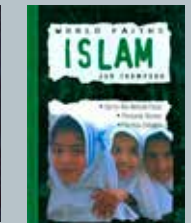
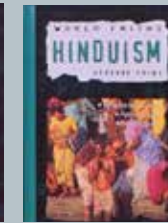
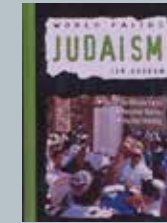
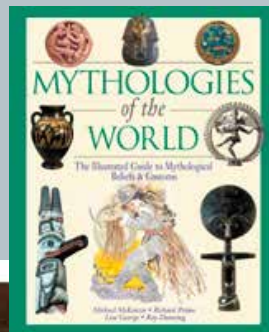
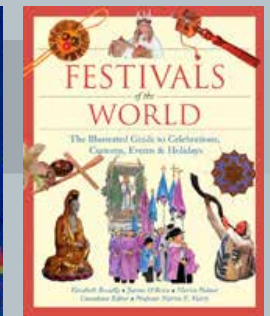
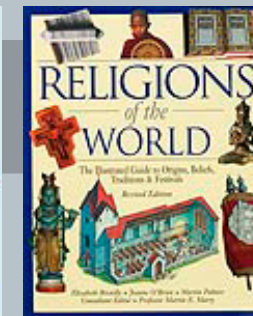
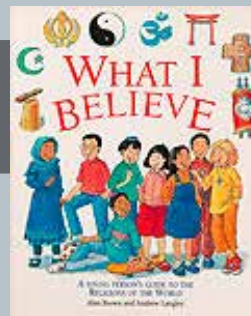
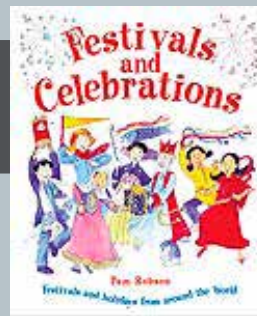






# RELIGIONS

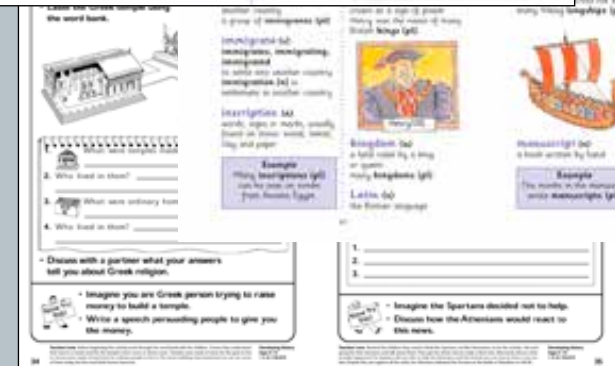
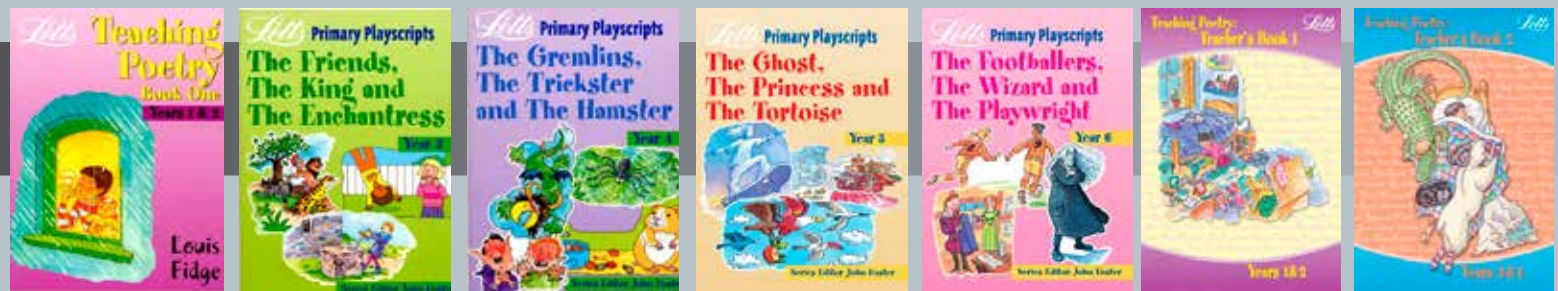
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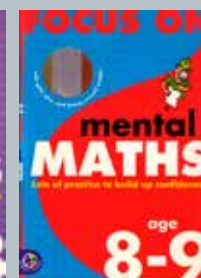
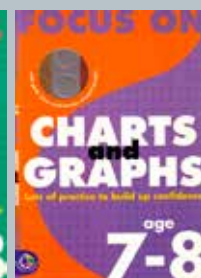
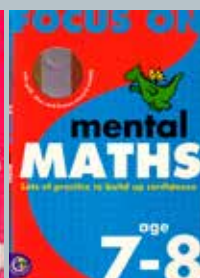
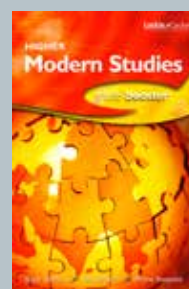
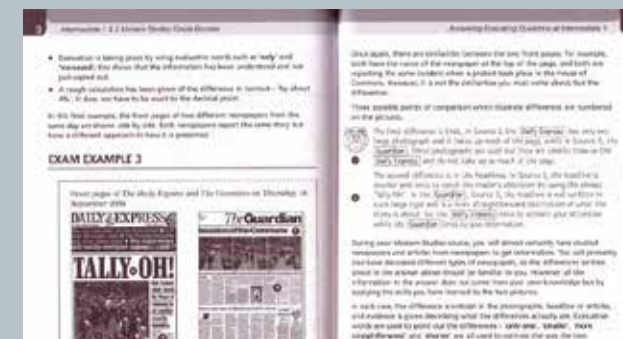
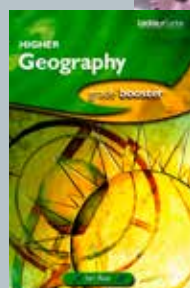
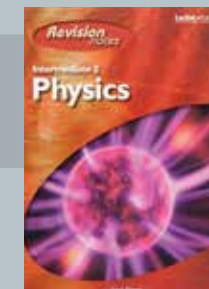
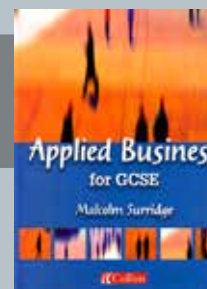
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