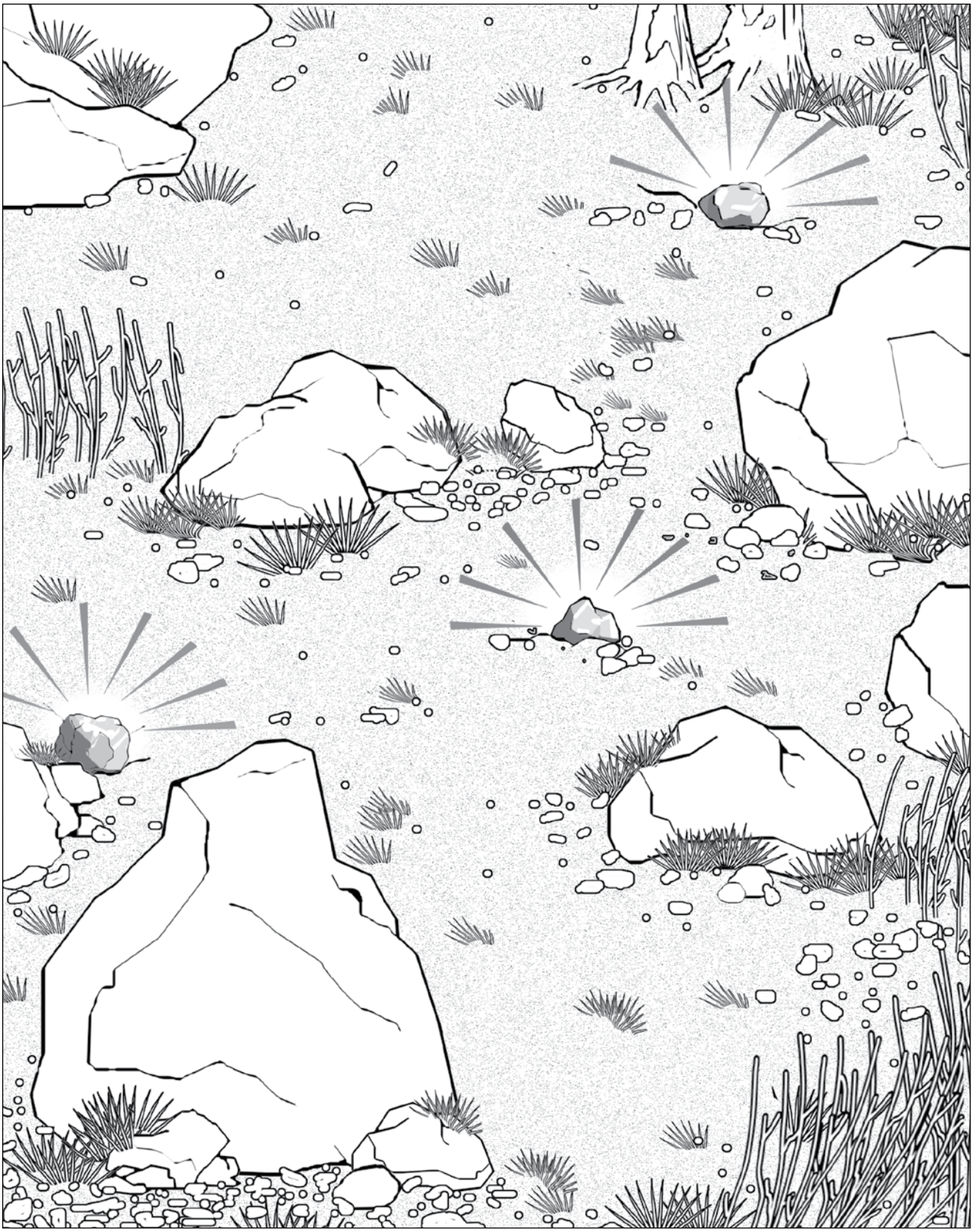
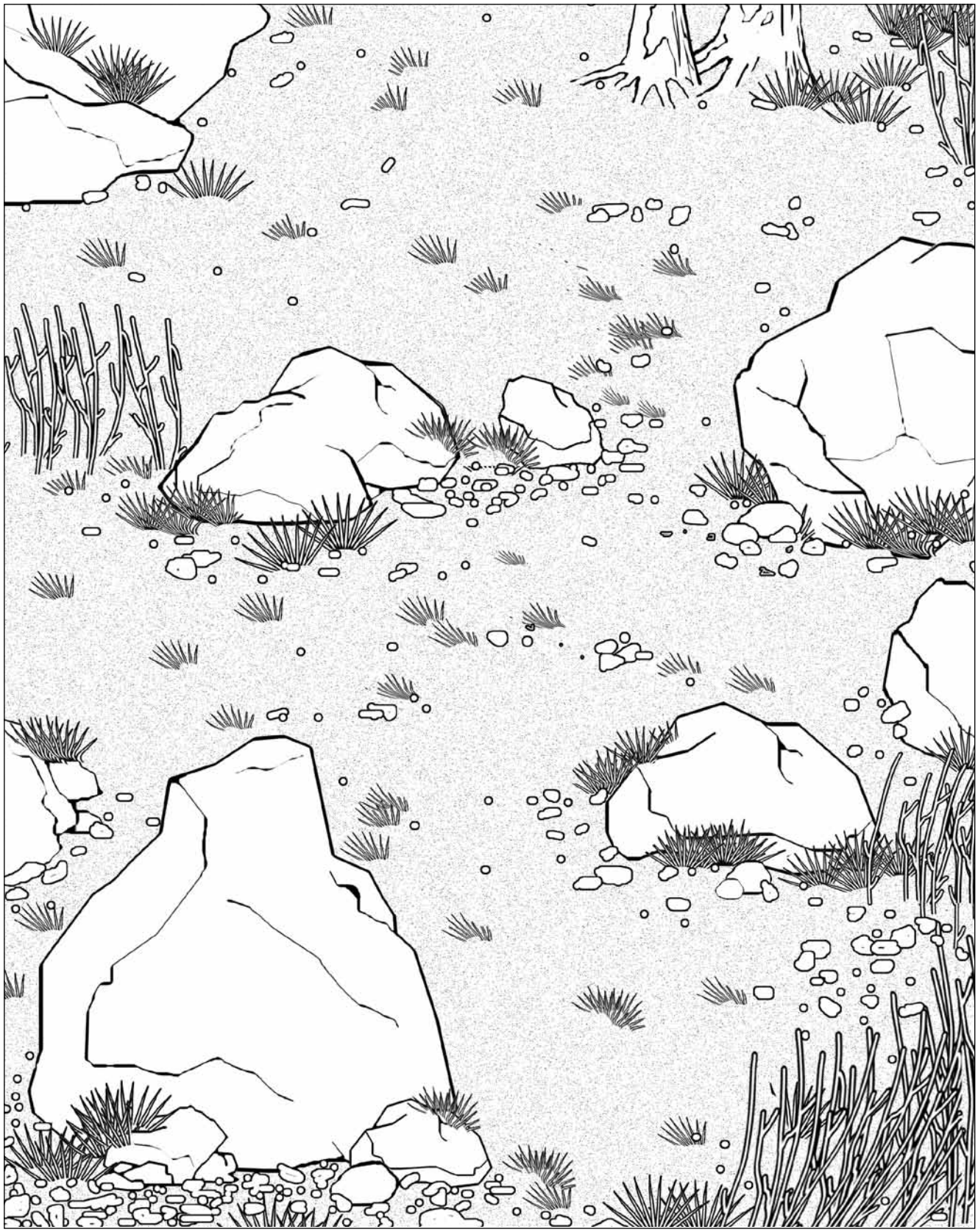
Gold Deposits



Dirt



Latitude Coordinates

53°N

53°20′N

Latitude Coordinates

53°40′N

54°N

Longitude Coordinates

104°E

104°20′E

Longitude Coordinates

104°40′E

105°E

In Search of Gold

Gold was discovered in the United States in January 1848. A carpenter named James Marshall was building a sawmill on the American River in Northern California when he saw something shining in the water. It was gold! Over the next two years, word of Marshall's discovery brought tens of thousands of gold seekers from all over the world to California. Gold production around the world exploded. It continued to expand when gold was discovered in Australia in 1851 and in South Africa in 1886. Today, South Africa is the world's largest gold producer.

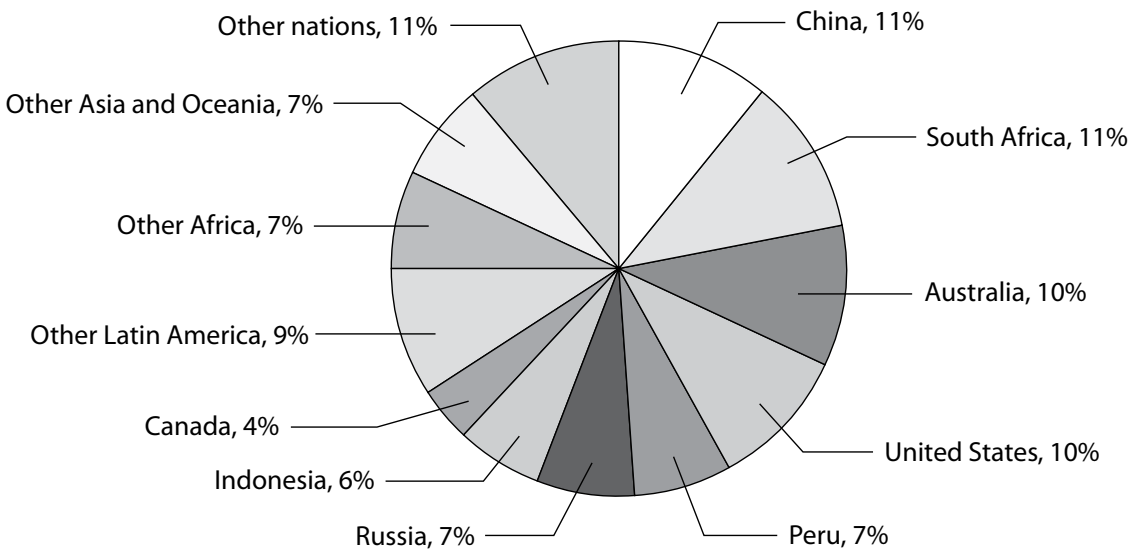
Ores of gold can be formed in two ways. One way is *exogenetic*, or formed at Earth's surface. As in James Marshall's case, exogenetic gold ores are often found in riverbeds, streambeds, and floodplains. Gold ores can also be *endogenetic*, or formed within Earth.

Gold mining begins after geologists have discovered a surface deposit. Large drilling machines are used to collect samples from the ground. The samples are analyzed to determine whether there is enough gold to open a mine. The first step in mining is to drill a pattern of holes in the ground near the gold deposits. Explosives are detonated in the holes to break up the ground. Sometimes mining is done using underground methods. A tunnel is created and then blasted with explosives. In both cases, the rubble is loaded into a truck and hauled away for processing.

After several processing steps, the gold is ready for use. About 85 percent of gold is used for decoration—mostly jewelry. Gold is used in some wires and cables. Some doctors use gold for patients with arthritis or cancer. Dentists sometimes use gold to fill cavities. Gold has even been used to protect firefighters. A thin, invisible film of gold on a face mask protects the face from heat while still allowing clear vision.

Gold mining is not without problems. It has serious consequences for the environment. It uses an enormous amount of water. In Nevada, mining uses more water than all the people in the state put together! Dangerous chemicals like cyanide and mercury are used in the mining and processing of gold. They can end up in local rivers and lakes, causing sickness and even death. Cleaning up contaminated sites costs millions of dollars.

Gold-Producing Nations, 2007



Source: *Survey 2008*, GFMS Limited.

Phase 1 Cards

Phase 1

Write the map's title in the northwest corner above the map.

1

Phase 1

How many picnic areas does the park have? Write the answer near the legend.

2

Phase 1

Draw a compass rose near the west edge of the map.

3

Phase 1

Label the two historical monuments south of the Gold Discovery Site.

4

Phase 1

Label the park buildings northeast of the Gold Discovery Museum.

5

Phase 1

Label the footpath you find at grid coordinates F1.

6

Phase 1 Cards

Phase 1

7

Label the park building whose absolute location is G6.

Phase 1

8

Trace two routes—each in a different color—from the Mill Site to the Jail Ruins.

Phase 1

9

What direction is Emmanuel Church from the Olde Coloma Theatre? Write the direction near the church.

Phase 1

10

What direction is St. John's Church from the schoolhouse? Write the direction near the church.

Phase 2 Cards

Phase 2

Write the name of the parallel at 0° latitude.

1

Phase 2

Write the name of the meridian at 0° longitude.

2

Phase 2

Write the name of the parallel at $23\frac{1}{2}$° north latitude and the name of the parallel at $23\frac{1}{2}$° south latitude.

3

Phase 2

Write the name of the parallel at $66\frac{1}{2}$° north latitude.

4

Phase 2

Label the city located at 47°N, 71°W.

5

Phase 2

Label the city located at 38°S, 145°E.

6

Phase 2 Cards

Phase 2

Label the city located at 41°N, 29°E.

7

Phase 2

Label the city located at 19°N, 73°E.

8

Phase 2

Label the two cities located north of 15° north latitude and east of 105° east longitude.

9

Phase 2

Label the five cities located south of 30° north latitude and west of 15° east longitude.

10

Phase 3 Cards

Phase 3

1

Find the distance between Washington, D.C., and New Carrollton. Draw a line between the two places, and write the distance on the line.

Phase 3

2

Find the distance between the Washington Monument and the Smithsonian Institution. Draw a line between the two places, and write the distance on the line.

Phase 3

3

Find the distance between Potomac and College Park. Draw a line between the two places, and write the distance on the line.

Phase 3

4

Find the distance between the Washington Convention Center and the National Portrait Gallery. Draw a line between the two places, and write the distance on the line.

Phase 3

5

What will you find approximately 3 miles north of Falls Church? Draw a line between the two places, and write the distance on the line.

Phase 3

6

What will you find approximately 0.75 mile west of the National Portrait Gallery? Draw a line between the two places, and write the distance on the line.

Phase 3 Cards

Phase 3

7

What will you find approximately 10 miles east of Alexandria? Draw a line between the two places, and write the distance on the line.

Phase 3

8

What will you find approximately 1.25 miles southeast of the National Aquarium? Draw a line between the two places, and write the distance on the line.

Phase 3

9

Which map will help you find your friend's apartment on New York Avenue? Write "find an apartment" near the map you would use.

Phase 3

10

Which map will help you decide if you should walk or take a taxi to Washington, D.C., from Arlington? Write "decide to walk or take a taxi" near the map you would use.

Phase 4 Cards

Phase 4

Label the largest continent.

1

Phase 4

Label the smallest continent.

2

Phase 4

Locate the United States. Within its borders, label the two hemispheres in which it is located.

3

Phase 4

Locate Africa. Within its borders, label the hemispheres in which it is located.

4

Phase 4

Label the continent directly north of Africa.

5

Phase 4

Label the ocean that touches the shores of Europe and South America.

6

Phase 4 Cards

Phase 4

Label the three continents that the equator runs through.

7

Phase 4

Label the ocean that lies north of Europe.

8

Phase 4

Label the ocean that touches the shores of both Asia and South America.

9

Phase 4

Label the ocean that lies to the south of Asia.

10

Phase 5 Cards

Phase 5

It is March 30 in St. Petersburg, Russia. Label the date and the season near that city.

1

Phase 5

It is June 30 in Tokyo, Japan. Label the date and the season near that city.

2

Phase 5

It is September 30 in Quebec City, Canada. Label the date and the season near that city.

3

Phase 5

It is December 30 in London, England. Label the date and the season near that city.

4

Phase 5

It is summer in Melbourne, Australia. Label the season in Rio de Janeiro, Brazil.

5

Phase 5

It is summer in Santiago, Chile. Label the season in Istanbul, Turkey.

6

Phase 5 Cards

Phase 5

7

It is winter in Shanghai, China. Label the season in Tehran, Iran.

Phase 5

8

It is winter in London, England. Label the season in Cape Town, South Africa.

Phase 5

9

Find the four tropical zone cities in the Southern Hemisphere. Label each of them *tropical zone*.

Phase 5

10

Find the two temperate zone cities that are in both the Northern and the Western hemispheres. Label each of them *temperate zone*.

Phase 6 Cards

Phase 6

1

Label each map projection with its name. (**Clue:** Look very carefully at the differences between the Robinson and Eckert IV projections.)

Phase 6

2

Color in North America on the map projection that shows the most area distortion.

Phase 6

3

Draw an equal sign in North America on the map projection that does not distort area.

Phase 6

4

Circle North America on the map projection that shows the most shape distortion.

Phase 6

5

Find the map projection that has a balance between area and shape distortion without affecting the oceans. Outline and draw an equal sign in North America on that map projection.

Phase 6

6

You own an outdoor adventure company that specializes in sailing trips throughout the Atlantic Ocean. You need to be able to determine accurate direction. Draw a sailboat on the map projection that is most helpful to you.

Phase 6 Cards

Phase 6

7

You work for the United Nations studying how many people live per square mile in various countries. You need to be able to determine the accurate size of land. Draw a stick figure of a person on the map projection that is most helpful to you.

Phase 6

8

You work for a book publisher that has to present a fairly accurate picture of the world. You need to avoid a lot of area or shape distortion. Draw a book on the map projection that is most helpful to you.

Phase 6

9

You study ocean life along the coast of Antarctica. You need to be able to see a continuous view of the ocean along the coast. Draw a fish with an X through it on the map projection that is least helpful to you.