

Supplementary Materials

Comprehension Passages for Testing:

Passage 1

Waterfalls are commonly formed in the upper course of the river. At these times the channel is often narrow and deep. When the river courses over resistant bedrock, erosion happens slowly, while downstream the erosion occurs more rapidly. As the watercourse increases its velocity at the edge of the waterfall, it plucks material from the riverbed. Whirlpools created in the turbulence as well as sand and stones carried by the watercourse increase the erosion capacity. This causes the waterfall to carve deeper into the bed and to recede upstream. Often over time, the waterfall will recede back to form a canyon or gorge downstream as it recedes upstream, and it will carve deeper into the ridge above it. The rate of retreat for a waterfall can be as high as one and half meters per year.

Often, the rock stratum just below the more resistant shelf will be of a softer type, meaning that undercutting due to splashback will occur here to form a shallow cave-like formation known as a rock shelter under and behind the waterfall. Eventually, the outcropping, more resistant cap rock will collapse under pressure to add blocks of rock to the base of the waterfall. These blocks of rock are then broken down into smaller boulders by attrition as they collide with each other, and they also erode the base of the waterfall by abrasion, creating a deep plunge pool or gorge.

Streams become wider and shallower just above waterfalls due to flowing over the rock shelf, and there is usually a deep area just below the waterfall because of the kinetic energy of the water hitting the bottom. After a long period of being fully formed, the water falling off the ledge will retreat, causing a horizontal pit parallel to the waterfall wall. Eventually, as the pit grows deeper, the waterfall collapses to be replaced by a steeply sloping stretch of river bed. In addition to gradual processes such as erosion, earth movement caused by earthquakes or landslides or volcanoes can cause a differential in land heights which interfere with the natural course of a water flow, and result in waterfalls.

A river sometimes flows over a large step in the rocks that may have been formed by a fault line. Waterfalls can occur along the edge of a glacial trough, where a stream or river flowing into a glacier continues to flow into a valley after the glacier has receded or melted. The large waterfalls in Yosemite Valley are examples of this phenomenon, which is referred to as a hanging valley. Another reason hanging valleys may form is where two rivers join and one is flowing faster than the other.

Waterfalls can be grouped into ten broad classes based on the average volume of water present on the fall (which depends on both the waterfall's average flow and its height) using a logarithmic scale. Class 10 waterfalls include Niagara Falls, Paulo Afonso Falls and Khone Falls.

Classes of other well-known waterfalls include Victoria Falls and Kaieteur Falls (Class 9); Rhine Falls and Gullfoss (Class 8); Angel Falls and Dettifoss (Class 7); Yosemite Falls, Lower Yellowstone Falls and Umphang Thee Lor Sue Waterfall (Class 6); Sutherland Falls (Class 5).

Questions:

Question 1

Where are waterfalls commonly formed?

- a) Upstream
- b) Downstream
- c) Near a rock face, like a cliff
- d) In a hanging valley

Answer: a)

Question 2

Why do streams become wider and shallower near a waterfall?

- a) Kinetic energy of the rocks hits the streams
- b) Streams flow over the rock shelf
- c) More water drains through a waterfall
- d) None of the above

Answer: b)

Passage 2

The Alaska pipeline, named for the state it is located in, starts at the frozen edge of the Arctic Ocean. It stretches southward across the largest and northernmost state in the United States, ending at a remote ice-free seaport village nearly 800 miles from where it begins. It is massive in size and extremely complicated to operate.

The steel pipe crosses windswept plains and endless miles of delicate tundra that tops the frozen ground. It weaves through crooked canyons, climbs sheer mountains, plunges over rocky crags, makes its way through thick forests, and passes over or under hundreds of rivers and streams. The pipe is 4 feet in diameter, and up to 2 million barrels (or 84 million gallons) of crude oil can be pumped through it daily. Resting on H-shaped steel racks called "bents," long sections of the pipeline follow a zigzag course high above the frozen earth.

Other long sections drop out of sight beneath spongy or rocky ground and return to the surface later on. The pattern of the pipeline's up-and-down route is determined by the often harsh demands of the Arctic and subarctic climate, the tortuous lay of the land, and the varied compositions of soil, rock, or permafrost (permanently frozen ground). A little more than half of the pipeline is elevated above the ground. The remainder is buried anywhere from 3 to 12 feet, depending largely upon the type of terrain and the properties of the soil.

One of the largest in the world, the pipeline cost approximately \$8 billion and is by far the biggest and most expensive construction project ever undertaken by private industry. In fact, no single business could raise that much money, so 8 major oil companies formed a consortium in order to share the costs. Each company controlled oil rights to particular shares of land in the oil fields and paid into the pipeline-construction fund according to the size of its holdings. Today, despite enormous problems of climate, supply shortages, equipment breakdowns, labor disagreements, treacherous terrain, a certain amount of mismanagement, and even theft, the Alaska pipeline has been completed and is operating.

Questions:

Question 1

Which is the largest and northernmost State of the United States?

- a) Arctic Ocean
- b) Alaska
- c) Greenland
- d) Seattle

Answer: b)

Question 2

Why was a consortium formed to build the Alaska pipeline?

- a) It is one of the largest pipelines in the world
- b) It faces problems like supply shortages, equipment breakdown, labour problems, mismanagement, etc.
- c) The cost of the pipeline could not be borne by a single company
- d) None of the above

Answer: c)

Examples of Good / Bad Organization

Source: <https://en.wikipedia.org/wiki/Rumpelstiltskin#Plot>

Good Organization:

In order to appear superior, a miller lies to the king, telling him that his daughter can spin straw into gold.

The king calls for the girl, shuts her in a tower room filled with straw and a spinning wheel, and demands she spin the straw into gold by morning or he will cut off her head. When she has given up all hope, an imp-like creature appears in the room and spins the straw into gold in return for her necklace. The next morning, the king takes the girl to a larger room filled with straw to repeat the feat, the imp once again spins, in return for the girl's ring.

On the third day, when the girl has been taken to an even larger room filled with straw and told by the king that he will marry her if she can fill this room with gold or execute her if she cannot, the girl has nothing left with which to pay the strange creature. The imp extracts from her a promise that she will give him her firstborn child and so he spins the straw into gold a final time.

The king keeps his promise to marry the miller's daughter. But when their first child is born, the imp returns to claim his payment. The girl offers him all the wealth she has to keep the child, but the imp has no interest in her riches. He finally consents to give up his claim to the child if she can guess his name within three days.

Her many guesses fail, but before the final night, she wanders into the woods, searching for him and comes across his remote mountain cottage and watches, unseen, as he hops about his fire and sings. In

his song's lyrics, ("tonight tonight, my plans I make, tomorrow tomorrow, the baby I take. The queen will never win the game, for Rumpelstiltskin is my name"), he reveals his name.

When the imp comes to the queen on the third day, after first feigning ignorance, she reveals his name, Rumpelstiltskin, and he loses his temper and their bargain. Rumpelstiltskin "in his rage drove his right foot so far into the ground that it sank in up to his waist; then in a passion he seized the left foot with both hands and tore himself in two".

Bad Organization:

In order to appear superior, a miller lies to the king, telling him that his daughter can spin straw into gold. The king calls for the girl, shuts her in a tower room filled with straw and a spinning wheel, and demands she spin the straw into gold by morning or he will cut off her head. When she has given up all hope, an imp-like creature appears in the room and spins the straw into gold in return for her necklace. The next morning, the king takes the girl to a larger room filled with straw to repeat the feat, the imp once again spins, in return for the girl's ring. On the third day, when the girl has been taken to an even larger room filled with straw and told by the king that he will marry her if she can fill this room with gold or execute her if she cannot, the girl has nothing left with which to pay the strange creature. The imp extracts from her a promise that she will give him her firstborn child and so he spins the straw into gold a final time. The king keeps his promise to marry the miller's daughter. But when their first child is born, the imp returns to claim his payment. The girl offers him all the wealth she has to keep the child, but the imp has no interest in her riches. He finally consents to give up his claim to the child if she can guess his name within three days. Her many guesses fail, but before the final night, she wanders into the woods, searching for him and comes across his remote mountain cottage and watches, unseen, as he hops about his fire and sings. In his song's lyrics, ("tonight tonight, my plans I make, tomorrow tomorrow, the baby I take. The queen will never win the game, for Rumpelstiltskin is my name"), he reveals his name. When the imp comes to the queen on the third day, after first feigning ignorance, she reveals his name, Rumpelstiltskin, and he loses his temper and their bargain. Rumpelstiltskin "in his rage drove his right foot so far into the ground that it sank in up to his waist; then in a passion he seized the left foot with both hands and tore himself in two".

Comments:

The well-organized text has each paragraph denoting a single idea. The first paragraph introduces the central problem of the story, where the miller boasts that his daughter can turn straw into gold. The second paragraph describes how the girl survived the first couple of times. The third paragraph describes the deal the girl made with the imp. The next few paragraphs detail what happens when the imp comes to collect his payment and the escape clause (para #4), how the girl learns the imp's name (para #5), and how she defeats Rumpelstiltskin (para #6).

The badly organized text does not have such divisions in the text.