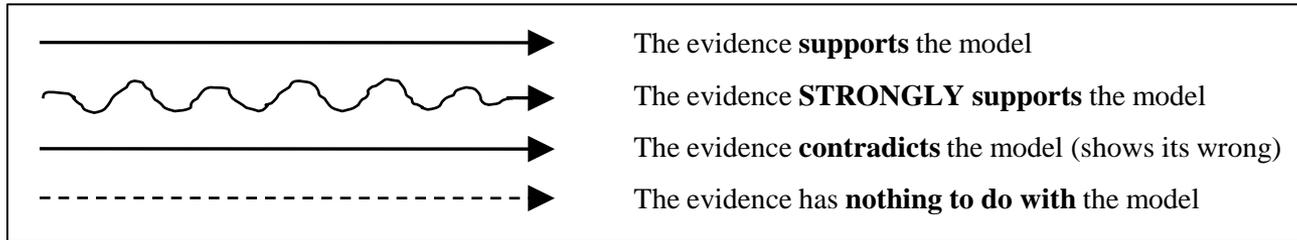# Transfer Model-Evidence Link Diagram

Name:_____

**Directions:** draw two arrows from each evidence box. One to each model. You will draw a total of 8 arrows.

**Key**:

| | |
|---|---|
| ⟶ | The evidence **supports** the model |
| ∿∿∿⟶ | The evidence **STRONGLY supports** the model |
| ⟶ | The evidence **contradicts** the model (shows its wrong) |
| - - - - ▶ | The evidence has **nothing to do with** the model |

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**Evidence #1**

Rainfall is greater on mountain sides facing the ocean than on sides facing the desert. Water is removed from the air as it passes over mountains. Many mountain ranges are between the Pacific Ocean and Las Vegas.

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**Model A**

The Las Vegas Valley has been a desert for almost a billion years. Mountains surrounding the valley keep the region dry. In the last billion years, the main changes in these mountains were caused by erosion.

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**Evidence #3**

There are many sedimentary rocks in and near Las Vegas. Sedimentary rocks are formed two ways. One way is the cementing of particles from pre-existing rocks. The other way is collection of falling particles on the sea floor.

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**Model B**

The area around Las Vegas has had many changes over the last billion years. The area was much wetter because it was covered by sea water for more than a hundred million years.

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**Evidence #2**

Fossils have been found in rocks around Las Vegas. Some of these fossils are from corals, clams, and other creatures that live under the sea.

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**Evidence #4**

Satellites show that the Earth's crust is composed of many plates. Satellites also show these plates are moving very slowly. Because of this movement, Las Vegas was once located in a tropical zone.

Provide a reason for three of the arrows you have drawn. **Write your reasons for the three most interesting or important arrows.**

A. Write the number of the evidence you are writing about.
B. Circle the appropriate word (**strongly supports | supports | contradicts | has nothing to do with**).
C. Write which model you are writing about.
D. Then write your reason.

**1. Evidence # _____ strongly supports | supports | contradicts | has nothing to do with  Model _____ because:**

**2. Evidence # _____ strongly supports | supports | contradicts | has nothing to do with  Model _____ because:**

**3. Evidence # _____ strongly supports | supports | contradicts | has nothing to do with  Model _____ because:**

**4. Circle the plausibility of each model. [Make two circles.  One for each model.]**

|  | Greatly implausible or even impossible | | | | | | | | | Highly Plausible |
|---|---|---|---|---|---|---|---|---|---|---|
| **Model A** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| **Model B** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

**5. Circle the model which you think is correct. [Only circle one choice below.]**

| Very certain that Model A is correct | Somewhat certain that Model A is correct | Uncertain if Model A or B is correct | Somewhat certain that Model B is correct | Very certain that Model B is correct |
|---|---|---|---|---|

**Evidence #1: Rainfall is greater on mountainsides facing the ocean than on sides facing the desert. Water is removed from the air as it passes over mountains. Many mountain ranges are between the Pacific Ocean and Las Vegas.**
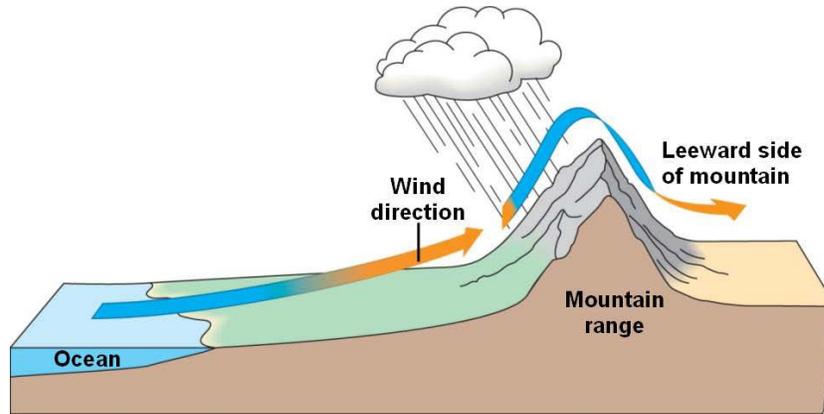


This figure shows winds blowing from an ocean, across mountains, and down to a desert. Winds blowing over the ocean transport water vapor to the land. The moist air rises because of the mountains and then cools. The water vapor condenses because of cooling and falls as rain. This happens on the mountainside facing the ocean. This wet side is called the windward side. The air going over the mountains is now dried. This dry air warms as it descends the side of the mountain that is away from the ocean. The dry side is called the leeward side.
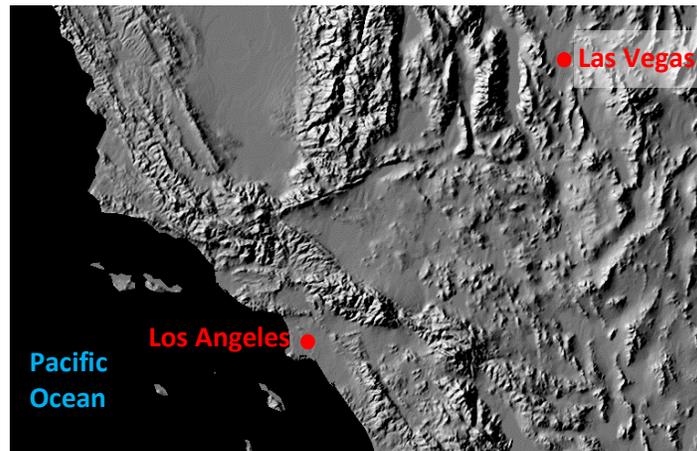


This map shows many mountain ranges between the Pacific Ocean and Las Vegas. Water in the air is removed as winds blow from the Pacific toward Las Vegas because of these mountain ranges.

**Evidence #2: Fossils have been found in rocks around Las Vegas. Some of these fossils are from corals, clams, and other creatures that live under the sea.**



These images show fossils found in limestone rocks near Las Vegas.

The image on the left is a clamshell fossil. This clamshell is located in a layer of rock that formed about 300 million years ago. Clams are creatures that live underwater.

The image on the right is a trilobite fossil. This fossil is located in a layer of rock that formed about 400 to 500 million years ago. Trilobites lived in Earth's oceans and seas. Trilobites became extinct about 250 million years ago.

**Evidence #3: There are many sedimentary rocks in and near Las Vegas. Sedimentary rocks are formed two ways. One way is the cementing of particles from pre-existing rocks. The other way is collection of falling particles on the sea floor.**

The two main types of sedimentary rocks in and around Las Vegas are sandstone and limestone.



The image above shows sandstone cliffs in Red Rock Canyon. Sandstone is formed from individual grains of sand. Over long periods, these grains cement together to form rock. Erosion from wind and flowing water formed sand grains from rocks that existed in ancient times.



The image above shows limestone rocks near Las Vegas. Limestone is one type of rock composed of carbonates. These carbonate rocks formed at the bottom of oceans and seas. Organic matter found in oceans will deposit on the sea floor making a deep layer of mud that is rich in carbon. Over long periods, these muds will solidify into rock.

**Evidence #4: Satellites show that the Earth's crust is composed of many plates. Satellites also show these plates are moving very slowly. Because of this movement, Las Vegas was once located in a tropical zone.**
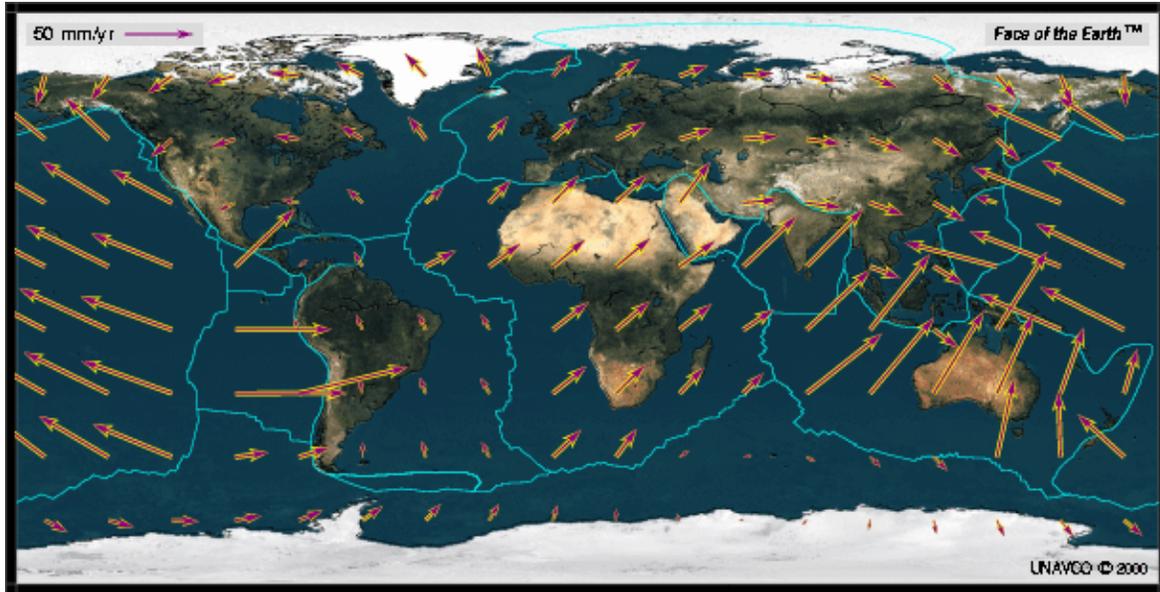


This image shows how Earth's crust is divided into plates. The blue lines indicate the boundaries of the largest plates. The arrows show the speed and direction the plates are moving. Long arrows indicate relatively fast movement (about 50 to 60 millimeters per year). Short arrows indicate slow movement (just a few millimeters per year).

Satellites measure plate movement precisely. Sensors are placed throughout Earth. We then use the global positioning system (GPS) to measure their speed and direction. This GPS system is much more precise than our car navigation system. Scientists can locate these sensors to a precision that is about equal to a grain of rice.

These data help us know positions in the past. The North American plate was once located along Earth's equator. The plates containing Earth's continents were also lumped together about 250 million years ago. This formed the supercontinent called "Pangaea." Las Vegas is located in the North American plate.