

# Floods Answer Sheet

## LEVEL 1

### Answers to *You're the Scientist: The Water Cycle*

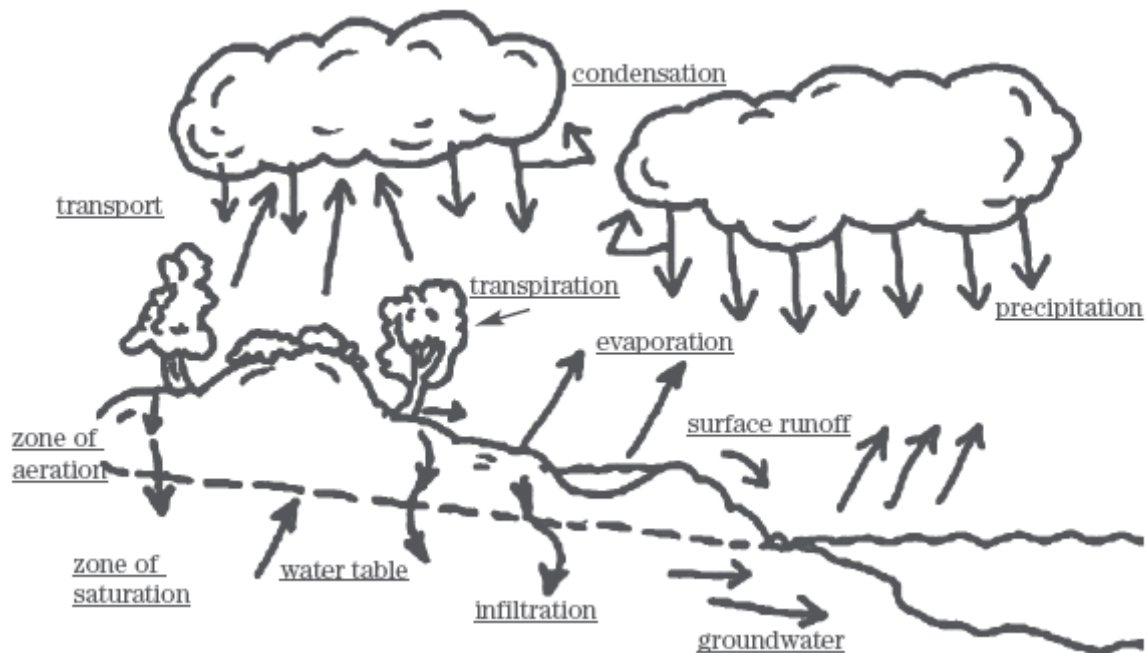
Water drops formed at the top of the bag. When the droplets got bigger, they fell down the sides of the bag back into the soil. This cycle will continue.

## LEVEL 2

None

## LEVEL 3

### Answers to *The Hydrologic Cycle*



### Answers to *Types of Floods*

**Flash flood:** Flooding that develops very quickly on streams and river tributaries usually as a result of thunderstorms. Sometimes the onset of flash flooding comes before the end of heavy rains. There is little time between the detection of flood conditions and the arrival of the flood crest. Swift action is essential to the protection of life and property.

**River flood:** Flooding that usually occurs on rivers after a flash flood has occurred on streams and tributaries. River floods develop and reach their peak more slowly than flash floods. In many cases the river flood peak occurs after the rain has ended.

**Coastal flood:** Flooding that usually occurs along an open coast, bay or inlet, and is caused by a storm surge and, in some instances, wave action caused by storms, wind or seismic forces.

**Urban flood:** Flooding occurring in an urban area where there is little natural terrain, such as fields and woodlands, to absorb precipitation. Instead, the water runoff from paved surfaces increases two to six times more than what would normally occur. An urban flood can fill basements or other low-lying areas with water and transform streets into raging rivers.

**Ice jam:** Sudden and uncontrolled flooding that occurs when the ice in a frozen river begins to break up, causing an ice jam in a narrow section of the river. When the jam finally breaks from the pressure of water backing up behind the ice, a huge and very rapid surge of water overflows the banks of the river.

**Debris flow:** Flooding that is characterized by a mixture of sediment and water where the flow becomes slurry, similar to wet concrete. In steep canyons debris flows can achieve high velocities and transport large boulders.

### **Answers to *You're the Hydrologist***

1. As the water continues to flow, you can see the channel begin to form and enlarge. Sand is deposited in a fan-shaped delta at the end of the stream, and the erosion of the river banks over a period of time will change the river channel.
2. Land would be more easily moved by the water, causing a broader delta, a faster-moving and growing channel and much greater erosion along the floodplain.
3. The channel would widen because the greater volume of water would broaden the streambed and would also move more soil downstream.
4. The water infiltrates the soil as the rainstorm intensifies.
5. Water rises in streams and streambeds when the soil becomes saturated and the groundwater supply increases. New channels are created from the runoff of overflowing banks.
6. The runoff flows into low-lying areas, through streambeds and into lakes.
7. The low-lying areas that surround the channel and its delta are the areas most affected by rising rivers and groundwater runoff.
8. Low-lying areas and depressions, such as lakes.
9. The high ground will remain unflooded, but its soil can become saturated and unstable. Buildings on the slope of a hill can slide. Higher areas farther from the floodplain are the safest places to build.

### **Answers to *Floodplain***

1. The deposition occurred along the banks of the river and low-lying areas of the floodplain. Much of the soil also fanned out into the delta at the mouth of the stream. This rich mixture of soil is excellent for agriculture, but the flooding is a trade-off.
2. Answers will vary depending on the composition of the soil mixture. Less porous soil, such as clay, will be deposited farther from the bank.

3. Answers will vary depending on the composition of the soil mixture. Less porous, heavier soil will sink to the bottom of the channel.