

## Core Skills Analysis

### Science

- Understanding basic physics concepts such as motion, force, and trajectory through observing how rocks skip on the water surface.
- Gaining insights into the relationship between speed, angle, and the number of skips a rock can achieve.
- Experiencing cause and effect directly by adjusting hand movements and rock selection to influence skipping success.
- Observing properties of different rocks, such as shape and weight, and how these affect their ability to skip.

### Physical Education / Motor Skills

- Practicing hand-eye coordination by aiming and throwing the rock at precise angles and speed.
- Developing fine motor control involved in selecting and tossing stones skillfully.
- Improving gross motor skills and balance during repeated throwing motions by the riverbank.
- Experiencing physical activity outdoors, promoting motor development in an engaging natural setting.

### Environmental Education

- Building awareness and appreciation of natural freshwater ecosystems by spending time near a river.
- Learning to interact responsibly with natural resources, such as safely selecting stones without disrupting habitats.
- Observing river surface conditions and environmental factors that influence rock skipping, like wind and water texture.
- Noticing seasonal or environmental changes impacting outdoor activities and ecosystem dynamics.

### Tips

To deepen understanding, encourage experimenting with different rock types and throw angles while documenting outcomes to learn scientific observation and recording methods. Introduce basic physics vocabulary such as friction, momentum, and trajectory in simple terms to frame the activity. Complement the outdoor fun with a river-side exploration focusing on river habitats and water safety. Encourage reflection on how natural elements influence play, paired with drawing or writing about the experience to integrate arts and literacy.

### Book Recommendations

- [Skipping Rocks](#) by Anne-Marie Harvey: A colorful picture book that explores the joy and technique of skipping stones, perfect for inspiring outdoor play and curiosity.
- [Magnificent Rocks and Minerals: A Closer Look](#) by Elizabeth Raum: Explains rock types and their properties with close-up images, helping kids understand what makes a rock good for skipping.
- [Science Experiments You Can Eat](#) by Vicki Cobb: Offers hands-on experiments, including motion and force activities, which connect well with the physics of skipping rocks.

### Learning Standards

- CCSS.ELA-LITERACY.RI.3.3 - Describe the relationship between a series of historical events, scientific ideas or concepts.
- NGSS 3-PS2-2 - Make observations and/or measurements of an object's motion to provide

evidence that a pattern can be used to predict future motion.

- PE 1.MC.A.1 - Demonstrate mature form when performing fundamental manipulative skills in movement activities.
- CCSS.ELA-LITERACY.W.3.8 - Recall information from experiences or gather information from provided sources to answer questions.

### **Try This Next**

- Worksheet to record types of rocks tested, number of skips per throw, and angles used, encouraging data collection and analysis.
- Drawing prompt to illustrate the trajectory of a skipping rock and label parts of the motion such as launch, skip, and splash.

### **Growth Beyond Academics**

This activity promotes patience and perseverance as the child experiments with different techniques to improve their throws. It encourages curiosity driven by immediate feedback from the environment and fosters a sense of accomplishment. The outdoor setting can enhance mood and reduce stress, while practicing a new physical skill boosts confidence and independence.