



ON THE PLAYGROUND

SCIENCE: FORCE & MOTION – MOTION IDENTIFICATION, EXERTION OF FORCE, GRAVITY

Every child is different. Do what works best for encouraging each child's exploration of this suggested activity.

OBJECTIVE OF THIS INVESTIGATION:

Children will explore force and motion through playing with balls on the playground.

VOCABULARY:

- push/pull
- fall
- roll
- drop
- up/down
- far/near

MATERIALS:

- a ball or variety of balls

PROGRESSION STEPS (SCIENCE: FORCE & MOTION – MOTION IDENTIFICATION, EXERTION OF FORCE, GRAVITY):

Visit [STEMIE Learning Trajectories](#) for details

- Motion Noticer
- Motion Recognizer
- Force Noticer
- Force Recognizer
- Gravity Noticer

THIS INVESTIGATION:

- Provide a variety of balls for children to explore and play with (big, small, smooth, bumpy, hard, soft, etc.).
- Demonstrate ways to move the ball and narrate using STEM vocabulary.
 - Notice if children track the ball with their eyes, chase after it, or show awareness in some other way that the ball is moving. **(Motion Noticer)**
- Encourage children to experiment with force and motion by rolling the ball back and forth.
 - Notice if children exert force to move the ball (e.g., push, kick, roll).
 - Do they repeat the action and try again? **(Force Noticer)**
 - Notice if children adjust the power of their push to get the ball to you (e.g., if the ball doesn't reach you the first time, do they push harder the second time?) **(Force Recognizer)**

ADAPTATIONS:

See [A Guide to Adaptations](#) for general ideas and strategies

Materials:

- Provide balls of different colors, textures, and sizes for easier visibility, grasping, and to increase engagement.
- Use pictures of children pushing, kicking, and otherwise moving balls to model the actions for children





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THIS INVESTIGATION (CONTINUED):

- Encourage children to move the ball in new ways, for example by throwing it and letting it fall to the ground.
 - Notice if children seem to anticipate that the ball will fall down (e.g., showing excitement when they throw it, trying to catch the ball, moving out of the way, etc.). **(Gravity Noticer)**

ADAPTATIONS (CONTINUED):

Instruction:

- Break down the steps of moving a ball into 1-2 steps.
- Ask children if you can help them to move the balls with hand-under-hand prompting.

HOW TO CONTINUE THIS INVESTIGATION:

- Encourage children to notice different types of movement. (e.g., roll, slide, bounce) **(Motion Distinguisher)**
- Encourage children to experiment with how much force is needed to get the ball to a certain object or goal. **(Force Identifier)**
- Encourage children to use gravity to move the ball (e.g., drop it from a height, send it down a ramp, etc.) **(Gravity Recognizer)**

SUPPORT MATERIALS:

