



Investigating Shadows

<http://bd058.k12.sd.us/pagelinks/ubd%20lesson.htm>

"Children do not live - as many still believe - in a mythical and pre-intellectual dimension, but they are capable of constructing thoughts and reflections because knowledge is with them, right from birth, in the heart of life itself.

Children, above all when together with other children, are inventors, "safe-crackers", and re-builders of theories and behaviors that elude any presumptuousness or predictability of methods.

Children do not wait for our permission to think. Indeed, children are bursting with ideas that are always impatient to escape through language (and we say a hundred languages) to connect and communicate with the things of the world."

Louis Malaguzzi educator and founder of the Reggio Emilia education community

What to do before beginning this exploration with your children?

Take the time to read the following:

Everything Has a Shadow Except Ants is a book that takes the reader through a project on shadows the children and teachers of the Reggio Emilia infant-toddler centre and preschoolers engaged in.

Reading this book will provide the early childhood educator with wonderful insights into the experience of exploring shadows with young children.

Chapter 4 Casting Shadows from *Developing Constructivist Early Childhood Curriculum*

This chapter discusses how to conduct shadow activities in a constructivist classroom.

Goals

- Children will demonstrate a sense of self as a learner
- Children will demonstrate the ability to think, reason, question and remember
- Children will engage in problem solving
- Children will use language to communicate, convey, and interpret meaning
- Children will establish social contacts as they begin to understand the physical and social world
- Children will use different art forms as a vehicle for creative expression and representation

Principles of Teaching

- Children will be able to formulate theories about shadows.
- Children will be able to test their theories about shadows.
- Children will be able to use a variety of tools to gather data about shadows.
- Children will be able to explain their theories about shadows.
- Children will be able to revise their theories about shadows based on their explorations.
- Children will document their theories and knowledge about shadows.

Literature Books

This is a listing of children's literature books that may create an interest in shadows and provide some provocation for the children to begin or to continue to explore the phenomena of shadows.

Ada, Alma. (2000). Friend frog. Orlando: Harcourt

Adams, Elizabeth and Banis, Budd. (2000). Me and my shadows: shadow puppet fun for kids of all ages. Science and Humanities Press

Anno, Mitsumasa (1988). In Shadowland. New York: Scholastic

Asch, Frank. (1999). Moon Bear's Shadow. New York: Aladdin

Bartalos, Michael (1995). Shadowville. New York: Penguin

Burford E Darkness Slipped In.. Kingfisher, MacMillan Children's Books

Paolille, Paul and Brewer, Dan (2001). Silver Seeds. New York: Penguin

Bulla, Clyde Robert (1994). What Makes a Shadow? New York: Scholastic Inc.

Carlstrom, Nancy White (1990). Where Does the Night Hide? New York: Macmillan

Chorao, Kay. (2001). Shadow Night. New York: Penguin

Crews, Nina (1995). One Hot Summer Day. New York: Greenwillow Books

Dorros, Arthur. (1991). Me and My Shadow. New York: Scholastic

Farber, Norma (1992). Return of the Shadows. New York: HarperCollins

Freeman, Don. (2000). Gregory's Shadow. New York: Penguin

Hoban, T. (1990). My Shadow. Boston: David R. Godine

Keats, Ezra Jack (1974). Dreams. New York: Macmillan
Kent, Jack. (1981). The Biggest Shadow in the Zoo. Parent Magazine Press
Mayer, B. (1995). Shadow Games: A book of hand and puppet shadows. Klutz, Inc
Munsinger, Lynn. (1991). Nothing Sticks like a Shadow. Boston: Houghton Mifflin
Narahashi, Keiko. (1987). I Have a Friend. New York: Simon and Schuster
Otto, C.B. (2001). Shadows. New York: Scholastic
Paul, Ann. (1996) Shadows Are About. New York: Scholastic
Sayre, A.P. and Stevenson, H. (2002) Shadows. New York. Henry Holt and Co.
Seuss, Dr. (1973). The Shape of Me and other Stuff. New York: Random House
Swinburn, Stephen. (1999). Guess Whose Shadow. Boyds Mills, Pa: Boyds Mills
Welling, Peter J. (2000). Andrew McGroundhog and his Shady Shadow. Pelican
Wilhelm, H. (2002). I Love my Shadow! (Hello reader level 1). New York: Scholastic

Materials

coloured cellophane, coloured plastic wrap, white drawing paper, tissue paper'

sheets, blankets, screen, tent

chalk, pens and pencils, markers and crayons, tape

tubes, tulle or netting, objects with holes

slide projector, flashlights, lanterns (battery)

clear containers to hold a variety of liquids and solids

measuring tools (ruler, yardstick, tape measure, string, etc.)

Create a provocation

This can be done by drawing on the some experience in the production of *Me and My Shadow* that has piqued the interest of children, using the pictures provided from the show

OR

This can be done by commenting on shadows as the children are playing outside on a sunny day with a question such as:

OR

Another way is to put an opaque cutout of a kite, a bird, a balloon, or a butterfly in the window of your classroom. Comment on the shadow it casts and what happens to the shadow as the day progresses.

Set up a Shadow Studio

Provide a variety of materials for the children to set up a shadow studio in the room where they can explore and experiment with shadows.

Chalk Outlines

Provide chalk and let the children trace their shadows several times during the day. Provide a means of measuring their shadows. Engage the children in conversation about what happened to their shadows during the day.

Children will formulate theories about shadows and engage in activities to test those theories.

Activities will depend on the theories the children form. For example, young children think of the shadow as an object. They think that light is the agent that causes the object to form or that allows people to see the shadow, even when it is dark.

It is extremely important that the content and experiences presented to the children match their cognitive capacities. This will allow the children to extend, apply, and interpret deeper meanings of the content. "...keep in mind that a child's view of the world and of scientific and mathematical concepts is not the same as yours.

Their perception of phenomena is formed from their own perspective and experiences. Misconceptions will arise. So, be ready to explore the world to expand their thinking, and be prepared for the next developmental stage.

Teach children to observe with all of their senses and to classify, predict, and communicate, so they can discover other viewpoints."

(Lind, 2001 <http://www.project2061.org/newsinfo/earlychild/experience/lind.htm>)

What Children Say About Shadows

Questions Children Have About Shadows

Are people the only things that have shadows?

Are shadows different colors?

Can we catch our shadow?

Can we make our shadows bigger, smaller?

Can you figure out a way to make your shadow hands larger, smaller?

Can we make our shadow run, hop, . . . ?

Can you get away from your shadow?

Can you make your hand shadow look like an animal?
Can you make your shadow hands touch without having your real hands touch?
Do fish make shadows in the water? How?
Do shadows talk?
Do you have a shadow at noon?
How does something make two shadows?
How does the shadow of your hand compare to the real thing?
How is a shadow made?
If I hold my hand close to the light, what happens to the shadow?
If there were no light, would there still be a shadow?
Our shadows were in front of us when we left, but are behind us now. What happened? How can we get our shadows in front of us again?
What kind of light makes shadows when you are outside on a bright sunny day?
What kinds of shadow shapes can you make?
What makes a shadow disappear?
What makes shadows at night?
Where and when do you see the best shadows?
Where do shadows go when the sun goes behind a cloud?
Why are shadows dark?
Will we be able to see the dots on the die's shadow?

Questions Reggio Children (aged 4-6) asked as they investigated shadows.

Why don't people's shadows have colors even if their clothes are colored?
Why is a shadow sometimes dark and sometimes light?
Why does a kid have three shadows sometimes?
If you switch shoes with somebody, do your shadows switch too?
Can you see shadows in the mirror?
Can you see your shadow when it is raining?
Are the shadows of snakes dangerous?
Can you see shadows in the sand?
What happens to a little shadow if it goes inside a big shadow?
Does it disappear or does it just go underneath?
Can a shadow be captured in a box?
Can three kids together have just one shadow?
To make a gigantic shadow, do you have to be close to the light or far from the light?
Can the shadow of an eraser be longer than the shadow of a pencil?
Why does a tree that always stays still have a shadow that moves?
Can a shadow disobey the light?

Question Frames for Teachers

Can you explain/tell me how it works?
Could you help me understand . . . ?
Could you tell me about . . . ?

Could you tell me what you were thinking?
Do you remember . . . ?
Do you think will . . . if . . . ?
Hmmm . . . How does that work?
How can . . . ?
How did you decide . . . ?
How do you know that . . . ?
How do you suppose . . . ?
I am curious about . . . ?
I noticed . . . but then here . . . Why?/Why not?
It seems like you think . . . if . . .
I see. What's happening here?
I wonder . . . ?
Suppose ?
That is very interesting. That time you . . . instead of . . .
Tell me about that.
Tell me why . . . ?
What are some of the things that . . . ?
What causes . . . to happen?
What do you think might have happened if . . . had not done that?
What is the problem you are trying to solve?
What kinds of things did . . . ?
What kinds of things usually happen when . . . ?
What might happen if . . . ?
What other ideas do you have about . . . ?
What would you do . . . ?h
Why can't I . . . ?
Why did that happen here?
Why do/does . . . ?
Why do you think . . . ?
Yah, but . . .
You said that . . . , but you know, I remember something different. Let's look at that part of . . . again and see what . . . ?

Resources for Teachers

Web Links

[Early Childhood/Elementary The Reggio Emilia Approach with Sydney GurewitzClemens and Debbie Heck](#)
[Children's picture book database at Miami University](#)
[Activities from a constructivist approach](#)
[DeVries,R. and Zan, B. *Creating a constructivist classroom atmosphere.*](#)
[Bob Miller's Light Walk](#)

Books

- Berk, L.E. and Winsler, A. (1995). Scaffolding children's learning: Vygotsky and early childhood education (NAEYC research into practice series, v.7). Washington, D.C.: NAEYC
- Bodrova, E. and Leong, D.J. (1995). Tools of the mind: A Vygotskian approach to early childhood education. Upper Saddle River, N.J.: Prentice-Hall
- DeVries, R., et.al (2002) Developing constructivist early childhood curriculum practical principles and activities. New York: Teachers College Press
- Forman, G. (1990). Constructive play: Applying piaget in the preschool. Boston: Addison Wesley
- Marine, D.J. (2000). Constructing early childhood science. Clifton Park, N.J.: Delmar Learning
- Reggio Children. (1999). Everything has a shadow except ants (second edition). Reggio Children: Italy
- Stupiansky, S. (1997). Building understanding together: A constructivist approach to early childhood education. Clifton Park, New Jersey: Delmar Learning