Target Ball

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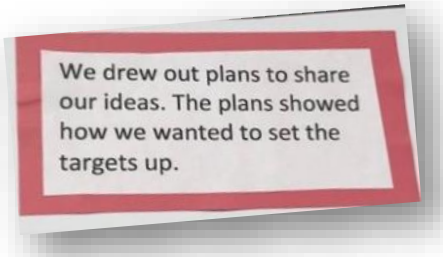
THE PURPOSE OF TARGET BALL

Two Types of Materials Needed:
Balls to roll
(different kinds and sizes)
Targets to strike
(cardboard blocks, milk cartons, cardboard cylinders from paper rolls, large juice cans, water bottles filled and/or empty, bowling pins, or any other soft materials that can be knocked down)

Playing Target Ball offers children the opportunity to develop reasoning in spatial thinking and force and motion. As they act on the materials by setting up groups of objects for targets, and then throwing or rolling balls to knock them down, they make predictions about what may happen and observe the results. Sometimes the results confirm their predictions and sometimes the results contradict their expectations. When that happens, children can compare the actions of:



- throwing vs rolling the ball at a target
- using a heavy vs a lighter ball to knock down targets
- using a large or smaller ball to knock down targets
- using an air-filled plastic vs a foam ball to knock down targets
- knocking down targets of different materials, shapes, weights, or sizes
- placing targets in different positions to knock more down with one roll

When children explore Target Ball with others, the game lends itself to sociomoral development. By noticing how other children use materials, a child may be stimulated to use materials in new ways. Playing the game with others encourages them to learn how to take turns, share materials, and create different rules for the game. They develop an ability to cooperate, negotiate with peers and adults, and make decisions. Sometimes, conflict arises (over use of materials, taking turns, etc.) and this conflict offers opportunities to develop understanding of self and others.

When children make up games involving knocking down the target, keeping score, and taking turns, they are growing in their understanding of causality and mathematics.

THE INTEGRATIVE NATURE OF TARGET BALL

Playing Target Ball is a context for developing concepts in many learning domains.

Science

Process skills of scientific inquiry

- Asking questions
- Planning and conducting investigations
- Gathering data
- Communicating findings
- Problem finding and solving
- Physics- force and motion

Mathematics

- Measurement
- Making comparisons
- Quantity
  - Tallies
  - More/Less
- Recognizing numerals
- Spatial and Geometrical concepts
  - Shape, size, position, direction

Social Studies

- Engaging in the democratic process in negotiating rules
- Social/emotional development

Literacy

Vocabulary development is fostered through:

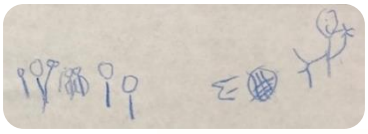
- Conversations during and about their experiences with adults and peers

Purposeful reading

- Reading documentation of their work on the walls of classroom
- Reading of co-constructed rules

Purposeful writing

- Documenting one's experiences
- Labeling materials they are using
- Co-constructing and writing rules



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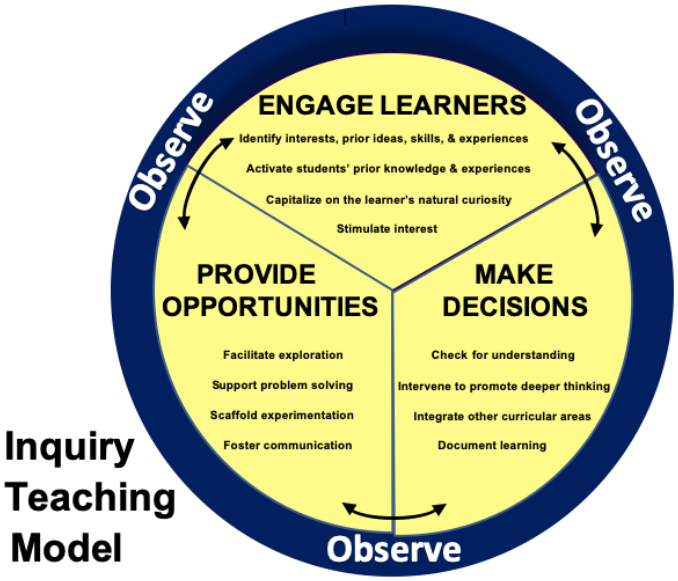
Understanding What Children Can Do

The Inquiry Teaching Model (Counsell et. al., 2015) is a framework developed by a group of educators to assist teachers as they develop, plan, implement, and evaluate STEM experiences. Close observation of children is at the heart of this model as it informs the teacher how to best engage learners, provide opportunities for deeper learning, and make informed decisions in order to improve the classroom environment for meaningful learning.



Inquiry Teaching Model

Children's investigations are supported by teacher interventions that focus on reasoning rather than right answers. The criteria for high quality STEM experiences are:

1.) Children must be able to ***produce*** an action
2.) Results must be ***immediate***
3.) Results must be ***observable***
4.) Children must be able to ***vary*** something that will produce a different result

Beginning with Target Ball

One way to begin is to introduce materials during group time and ask the children if they have ideas about how to use the materials. The children's ideas may surprise you. Accept their ideas and suggest that they can try out their ideas during activity time. Until age eight or nine children have difficulty controlling variables in STEM experiences so teachers must think carefully about how to introduce materials, the amount and variety of materials, and the way that materials are arranged so that children view and compare the available items.

If interest wanes, the teacher may go to the center and model using the materials in different ways (setting the objects side by side across the floor; placing one object in front of the others; or stacking them two or three objects high, etc). Seeing new ways of using the materials usually stimulates children to try new ideas of their own. When children test their ideas to see if they will work, they reason to make sense of their world. Teachers can also intervene at appropriate times with questions that encourage reflective thinking.

Before introducing any STEM experiences to children, it is important for **YOU** to take time to experiment with the materials and anticipate what questions children may have and what additional materials may scaffold the experience.

Questions to Consider in Target Ball

- What happens when you use the large ball rather than the smaller ball?
- What materials did you use to make the tower that was difficult to knock down?
- Which materials made the "best" tower?
- Did you keep score? How did you decide on the points?
- How many points did you get for a "knock-down" on the first try?
- Did you get a practice throw?
- How many turns did each person get?
- What happens when the ball hits the target but the tower doesn't fall down? Do you get any points?
- How did you decide who would be the tower builder?
- How did you decide who would go first?
- How did you decide where each person would stand?

Recommended Resource/Reading

Kamii, C., & DeVries, R. (1978/1993). *Physical Knowledge in Preschool Education: Implications of Piaget's Theory*. New York: Teacher's College Press

Counsell, S., Escalada, L., Geiken, R., Sander, M., Uhlenberg, J., Van Meeteren, B. & Zan, B. (2015). *STEM learning with young children: Inquiry teaching with ramps and pathways*. Teachers College Press.

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