Our labs work with teachers to create science learning opportunities in the preschool classroom. One aspect involves designing learning experiences that support preschoolers’ emerging understandings of the notion of a variable. Here we present preliminary results, using three tasks designed to elicit this emerging understanding that a comparison yields useful information.

Method 1 - Choosing a Comparative Test

Participants
• 19 preschoolers (mean age = 4.11 range = 4.4-5.4, 12 girls)
• Ethnically and socio-economically diverse sample
Before assessment, all participants engaged in activities designed to illustrate that comparative tests are more informative than demonstrations when answering “find out” questions (Figure 1).

Method
• Children heard 6 simple stories with photographs. Each story had the goal of finding out which of two “contestants” performed better: which cream heals boo-boos faster; which sponge cleans up more juice; which toy car goes faster; which wind-up toy travels farther; which glove keeps hands warmer; and which ball bounces higher.
• Children were asked to choose between a comparative test and a non-comparative test as the best way to answer the “find out” question and to justify their responses.

Q: Remember, he wants to find out if one of the cars, the blue or the yellow, goes faster. If you had to find that out, which way would you do it? This way or that way?

Findings
• Each child received a score (out of 6) for the number of times s/he chose a comparative test.
• Group scores exceeded chance. mean proportion correct = .67 / (18) = 2.43, p < .05.
• As shown in Figure 2, 8 children showed a robust tendency to choose the proper test (5 or 6 correct).

Method 2 - Generating a Test: Try It Task

Participants
• 18 preschoolers from the same sample

Method
• Short, scaffolded interactions between child and experimenter
  • The experimenter presented a testable question (e.g., Which pads work better to protect your hands?) and asked the child to “find out,” using the materials provided. The procedure varied slightly between schools due to changes after piloting.

Findings
• 7 children generated the best kind of test (simultaneous comparison while varying the variable). Two additional children did so with minor prompting.
  • As a point of comparison, among children who did not participate in our intervention, only 1 (out of 14) constructed a simultaneous, comparative test.
  • Sequential testing seemed the default response to the materials. Five intervention and 9 non-intervention students employed this method.

Method 3 - Prompted Recall

Participants
• 17 preschoolers from the same sample

Method
• Photos and a graduated prompt procedure were used to probe children’s memory for, and understanding of, a previously completed classroom experiment testing the insulating properties of gloves created with plastic bags and various filler materials such as feathers and solid vegetable shortening (Figure 5).

Findings
• 12 children answered the “What were we trying to find out?” question without prompting, and 2 did so after a prompt.
  • 12 children gave an appropriate answer (verbal or pointing) to the question “What did we do to test which gloves keep hands warmer?” and 3 did so after a prompt.

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