

Kindergarten Numeracy Development: Constructing 3D Models of Everyday Objects

Developmental aspects	Emerging With direct support... 	Developing With guided support... 	Applying With minimal support... 	Extending 
The Child	With direct support, and teacher modeling, may participate and may attempt to make sense of mathematical experiences.	With guided support, demonstrates a willingness to explore mathematical ideas while participating in problem solving experiences. Is beginning to show an awareness of numbers, space and time used in everyday life.	With minimal support, demonstrates interest in and a willingness to explore mathematical ideas while purposefully participating in problem solving experiences. Communicates an awareness of how numbers, space, and time are used in everyday life.	Shows interest and curiosity while purposefully exploring mathematical problem solving experiences. Perseveres. Makes and explains connections to numbers, space and time as used in everyday life.
Understanding Shape and Space				
Constructing 3D models of everyday objects	With direct support, uses building materials, and may name the representation.	With guided support, builds and connects the representation to a specific object (e.g. this is a bridge)	With minimal support, builds a somewhat recognizable structure, and describes the representation using simple language.	Builds representations with key features and details, and describes using comparative language.
The Support/Scaffolding*	The Model: showing, instructing, explaining, directing, making explicit, demonstrating, giving examples	The Coach: structuring, sequencing, focusing, cueing, guiding, organizing, supporting	The Advisor: suggesting, reminding, prompting, monitoring, asking for elaboration	The Mentor: extending, stretching, wondering aloud, exploring, "what if-ing"
*a variety of supports (teachers, peers, environmental, etc.) can be provided at any stage of development				

Scenario: During centre time, some children are building at the construction centre using the Lego materials.



Direct Support

Stelios is working with the centre materials. Knowing that Stelios needs direct support to make connections between activities and ideas, the teacher *directs* Stelios to talk about his representation by saying, "Tell me about what you have built here." Stelios answers, "It's nothing—I'm just building..." The teacher *shows* Stelios how to name his construction by giving an example: "Hmmm. It reminds me of a house." Stelios replies, "A house...no, a garage." He takes a small toy car from his pocket and drives it toward the construction.



Guided Support

Damian is at the construction centre fiddling with the materials. Guessing that he needs guided support to get started, the teacher *cues* him to *focus* on making a representation by asking, "What are you thinking about building today, Damian?" Damian thinks for awhile, then answers, "Maybe a place for my horse. I went to see my Grampa and he's got some horses. He said I can ride one when I get bigger."



Minimal Support

Jed has built a structure resembling an igloo and is describing it to Angie, who has come to admire it. Jed says, "It's like those ice houses we saw in that story yesterday. I'm trying to make a door, but it keeps falling down." Angie provides minimal support by *suggesting*, "Maybe you can do it with these pieces here. Can I help you?" Jed exclaims, "Oh yeah! Let's try it!" They begin to work together.



Without Support

Bashee and Tobin are planning to make a space ship, and without support are discussing what they will need. Tobin says, "Let's use triangle pieces for the front part, OK? He begins to build. Bashee is working on a cube shape. She says, "This cube can be for the astronauts to sit in. It will need to be bigger so they can both fit in."



Children are naturally interested in geometry and find it intriguing and motivating; their spatial capabilities frequently exceed their numerical skills, and tapping these strengths can foster an interest in mathematics and improve number understandings and skills.