Dual Latching System

3rd Grade STEM

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Subject(s)	Inquiry Question(s)
Engineering techniques	How can you design and build door latch systems with mostly cardboard?

Materials					
	Pre-cut pieces of cardboard (older students can cut their own)				
	Jumbo craft sticks with at least one hole punched near one end				
	A brad (brass fastener)				
	A single-piece clothes pin with a flat side				
	Glue				
	Misc. attaching supplies (binder clips, Velcro, push-pins, rubber band, magnets)				

Teacher-led activity/demo

Show sample and lead discussion; explain task; demonstrate technique as needed

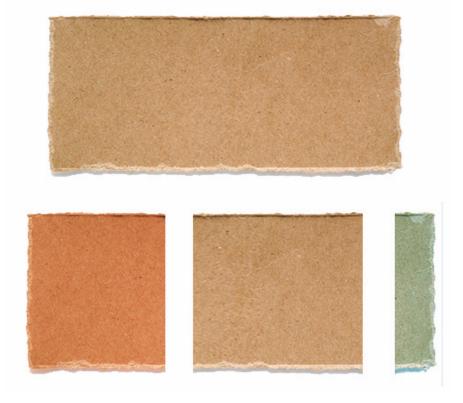
Student Tasks		Rubric Goals	
View sample and observ	View sample and observe/discuss how it's made		Active listening
			Raising hand, participating in
			discussion
			Observation skills
	vith provided materials; add		Reverse engineering
drawings and/or words t	o inside (to be seen when		Assembling
Brainstorm on other way	s doors are kept closed		Brainstorming
(cabinet doors, room do			Problem-solving
Design a different latchir	Design a different latching system and sketch or make notes on how it's made and what materials are		Creative/conceptual thinking
make notes on how it's r			Participation
needed			Engineering design
Build the original latch of	on the opposite side of the		At least 12 techniques
cardboard from the non-	original latch		Clear and neat
	llow to try the latch; make it		Testing design
sturdier or otherwise ite	rate as needed		Iterating design

RUBRIC for Assignment

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30 (31) Possible Points each	Room for improvement (1-3) IB 1-2	Meets most expectations (4-6) IB 3-5	Meets or exceeds most expectations (7-10) IB 6-7	Extra credit (+1/2 point each) IB 8
Objective	Incomplete	Skipped some tasks	Both side completely done	N/A
Ideation	Little to no originality in second latch	Somewhat original second latch	Original second latch	Exceptionally creative original design
Technique	Sloppy, not sturdy	Pretty good technical construction	Very good technique	Exceptional technical skills
Function	Latches don't work consistently	Does not work consistently	Works as it should	N/A

INSTRUCTIONS: 1. Cut a cardboard rectangle into 3 pieces like this. Then cut additional piece identical the the orange and green pieces.





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(flat clothes pin)

- 2. Glue the narrow strip to (green) the right edge of the largest piece (brown).
- 3. Use three pieces of masking tape to hinge the medium sized cardboard (orange; this is the door) to the other edge of the large piece (beige).
- 4. Glue a 1-piece clothes pin onto the narrow strip (green) with the opening at the top.
- 5. Lay a craft stick with a drilled hole (the latch stick) diagonally across it in such a way that the latch stick slides down into the clothes pin.
- 6. Use a pen or marker to where the hole goes.
- 7. Use a golf tee or an awl to punch the hole in the door (orange).
- 8. Then flip the assembled larch over and do the same on the opposite side: glue the narrow strip back to back with the narrow strip, hinge the door in the same place as the door.
- 9. Create a different latching system.
- 10. Open each door and draw or write something inside the door.

