








## The crosscutting concepts and quick start questions to explore them.

	<b>Crosscutting Concepts</b>	Quick Start Questions
	<b>Pattern:</b> How do you know a house when you see one? Zander's drawing fits the recognizable <i>pattern</i> with windows, a door, and a roof.	How do I know one when I see one? (What repeats?) What can I predict? What is causing this pattern?
	<b>Cause &amp; Effect:</b> When Zander draws smoke coming out of the chimney (an <i>effect</i> ), we know there must be a <i>cause</i> .	What happened? Why did it happen? How did it happen? (That's the mechanism)
	<b>Structure &amp; Function:</b> The tall and hollow <i>structure</i> of the chimney serves the <i>function</i> of drawing the smoke away from the house.	What does it do? What is its shape? What are the physical properties? How do the shape and physical properties enable its function?
	<b>Scale, Proportion, &amp; Quantity:</b> Notice that Zander has drawn a foot above the house which helps us instantly know the <i>scale</i> of the house—it is a dollhouse.	Pick a familiar object and ask: What's your reference point? Is this bigger, smaller, heavier, faster, the same as the reference point?
	<b>Systems &amp; System Models:</b> The house in the drawing is a perfect example of a system since it has <i>boundaries</i> and <i>interacting components</i> (windows, door, & roof). We can view this system as a dollhouse or as a <i>model</i> for larger houses.	Where does the system begin/end? That is the boundary. What are the parts of the system and how do they interact? Use a model to ask "what if..." we made a change?
	<b>Energy &amp; Matter:</b> The foot above the dollhouse implies that something ominous is about to happen to this system when the foot lands on it. Zander shows his understanding that <i>energy and matter</i> are the two primary influences that cause things to happen.	What is the system doing? What is the fuel that is causing something to happen? Is the matter in the system transformed?
	<b>Stability &amp; Change:</b> In his drawing, the house is <i>stable</i> , but as the foot crushes it, the dollhouse will <i>change</i> .	Is something happening in the system? <b>No</b> —the system is in <i>static equilibrium</i> . <b>Yes</b> . Are the boundary or interacting components changing? <b>No</b> —the system is in <i>dynamic equilibrium</i> . <b>Yes</b> —the system is <i>changing</i> .