

### APPENDIX 3

#### ACTIVITY SUB-SECTIONS: UNIT 2, CYCLES 3-5

Activity sub-sections where significant amounts of sense-making discussion (SMD) had been expected are shown in ***bold italics***.

#### Cycle 3: Combining Pushes and Pulls

Activity 1, Elicitation: Can you lend me a hand?

What are your ideas?

***What does your team think?***

***What really happens?***

***Prepare your wipe board!***

What ideas does your academy have?

Activity 2, Development: Lots of pulls!

***What does your team think?***

***What really happens?***

***Making sense***

Idea journal

Activity 3, Development: Lots of pushes and pulls!

What do you think?

***Let's find out! (What really happens?)***

***Making sense***

Idea journal

Activity 4, Consensus: Putting it all together

***Now what ideas does your team have?***

***Prepare your team wipe boards!***

What ideas does your academy have?

Activity 5, Power Drive: Going fishing

#### Cycle 4: Resistive Interactions

Activity 1, Elicitation: Will it slow down?

***What do you think? (What does your team think?)***

***Sharing your ideas (Prepare your wipe board)***

Idea journal

Computer simulation

Activity 2, Development: What's a little friction?

***What really happens?: Rubbing hands and sanding blocks***

***What really happens?: Applying energy ideas***

***What really happens?: Exploring bumpiness and applying pushing/pulling ideas***

Computer Simulations

***Making sense***

Idea journal

Activity 3, Development: Slowing down

***What really happens?: Sliding blocks***

***Making sense***

Idea journals

Activity 4, Development: No friction?

***Making sense***

Idea journal

Activity 5, Development: What's a little drag?

Watching a video

***What really happens?: Exploring drag***

Computer simulations

***Making sense***

Idea journal

Activity 6, Consensus: Putting it all together

***Now what does your team think?***

***Prepare your team wipe board!***

What ideas does your academy have?

Activity 7, Power Drive: What happened?

### Cycle 5: Non-contact Interactions -- Gravity

Activity 1, Elicitation: What causes gravity?

What do you think?

***What does your team think?***

***Sharing your ideas (Prepare your wipe board)***

Idea journal

Activity 2, Development: Exploring what causes gravity

***What really happens?: Is gravity caused by the earth's magnetism?***

***What really happens?: Is gravity caused by the earth's rotation?***

***What really happens?: Is gravity caused by air pressure?***

***Making sense***

Idea journal

Activity 3, Development: More exploration of what causes gravity

***What really happens?: What causes gravity?***

***What really happens?: Earth gravity vs. moon gravity***

***Making sense***

Idea journal

Activity 4, Development: Gravity and motion

***What really happens?: Interaction diagram, paper dropping, computer simulations***

Making sense

Activity 5, Consensus: Putting it all together

***Now what does your team think?***

***Prepare your team wipe board!***

Academy discussion!

Activity 6, Power Drive: Power Drive