LCM Informal Loop

LCM Lesson Plan: Comparing Friction
Science Standards: A-6, B-1, 2, D-1, 3
Math Standards: B-1, E-1, 2
Cultural Standard: B-2 relevance to traditional forms of transportation and hauling loads such as in dogsledding and moving canoes to the water
Science concept: Friction varies with type of surface

Name	Patty Brown
Grade level	5th-6th
School	Haines Elementary
City	Haines

	Process Skills	**Materials**
Gear- Up: Ask students to share experiences they have with sliding: into home plate, sledding and snowboarding, slipping on ice, socks on a freshly waxed floor. Have a student demonstrate dragging a pillowcase full of heavy clothes across carpet then across the tile floor and describe the experience.	Communicating	5th-6th graders room with both carpet and tile
Explore: Students will drag a brick across various surfaces (carpet, ice, oily lab table, dry lab table) and measure force required to move the brick in each case (reading the scale on a Newton meter); they will do multiple trials of each to increase validity and record information in a table (see attached.)	Observing Measuring Communicating	Newton meter to 20 N String Brick Vegetable oil Carpet remnant Cookie sheet with ice (prepare night before)
Generalize: Share data and discuss experiences within and between lab teams. Which surface provided the most friction? Which provided the least? Why? How are your results different from another team's?	Communicating Inferring	
Apply/Assess Why and in what situations might this type of information be important to know? What might be added to a surface to either increase or decrease the friction in that situation?	Inferring Predicting	**Vocabulary** Newton meter Newton Friction Drag
Extensions Students will be provided with photographs and create a Power Point explaining their investigation. Invite a police officer to discuss the role of friction in winter driving Students create safety posters for around town reminding people of the hazards of walking and driving on icy roads		

SURFACE	FORCE REQUIRED TO MOVE (in Newtons)			
	Trial 1	Trial 2	Trial 3	Comments
Dry table				
Oily table				
Wet table				
Carpet				

Answer these questions after discussing them with your team. Use the back of the paper if you need to.

1. Which surface provided the most friction? Which surface provided the least?

2. Were results of other teams different? How?

3. Why and in what situations might this information be important to know?

4. What could be added to a surface to either increase or decrease friction in one of those situations?

SCORING GUIDE FOR FRICTION LESSON

DATA TABLE COMPLETION	**3**	**2**	**1**
	Data Table is completely filled in, data is logical or explained in comments	Data Table is incomplete OR not logical in some entries and not explained	Data Table is incomplete AND has illogical entries that are not explained
EXPLAINING REAL-LIFE APPLICATION	**3**	**2**	**1**
	Student can explain three examples where this information could be useful in real-life	Student can give one example where this type of information could be useful in real-life	Student cannot give any examples where this type of information could be useful in real-life
WHAT TO ADD TO A SURFACE	**3**	**2**	**1**
	Student can give an example of a way to BOTH increase and decrease friction between two surfaces	Student can give an example of EITHER a way to increase or to decrease the friction between two surfaces	Student does not give any example of a way to increase or decrease the friction between two surfaces