



Galvin Physics Forest Evaluation Toolkit
Submitted by Evaluation and
Training Institute
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Administration Procedures

Science Attitudes Survey

Begin by telling students that Kidspace wishes to find out how they feel about science. Emphasize that this is not a test and that there are no right answers. Encourage honesty. Distribute survey forms and ask students to write the first two letters of their first name, the first three letters of their last name, and their birthdate in the provided spaces. (This identification code will allow us to match each student's pre-test taken before their visit to Kidspace to their post-test taken after the visit.)

For K-1st graders:

Explain that together you will read some statements about science and that the students should think about how they feel about each statement. Hold up a copy of the survey so that the students can see the first page. Point to the picture of the frowning face and ask students to look at the same picture on their own survey. Discuss the mood of the face (e.g., unhappy, dislike, angry). Then move to the next picture and discuss the mood of the face (e.g., not happy or unhappy) and the final picture (e.g., happy). Explain that after you read a statement, students should circle the picture that is closest to their own feelings. Read each item slowly and distinctly; then read it a second time while students are thinking. Be sure to read the item number and to remind students of page numbers when new pages are reached.

For 2nd-8th graders:

Read instructions and practice questions aloud.

- For 2nd-4th graders, read each item aloud slowly and distinctly; then read it a second time while students are thinking. Be sure to read the item number and to remind students of page numbers when new pages are reached. Provide clarification as needed as students respond to the statements.
- For 5th-8th graders: Explain that students will complete the survey on their own and that you are available to answer any questions about any of the statements. Provide clarification as needed as students respond to the statements.

Science Content Survey

Begin by telling students that Kidspace wishes to find out how they think about science. Emphasize that even though they are in school, this is not a test and that responses will not be graded. Distribute survey forms and ask students to write the first two letters of their first name, the first three letters of their last name, and their birthdate in the provided spaces. (This identification code will allow us to match each student's pre-test taken before their visit to Kidspace to their post-test taken after the visit.)

For K-4th graders:

Explain that together you will read some science questions and that the students should think about their answer. They should circle the response that best matches their answer. Read each item slowly and distinctly; then read it a second time while students are thinking. Be sure to read the item number and to remind students of page numbers when new pages are reached.



For 5-8th graders:

Explain that students will complete the survey on their own and that you are available to answer any questions about any of the questions. Read instructions aloud and provide clarification as needed as students respond to the questions.



Science Content Survey: K – 1st Grade

Background Questions:

Please write the first two letters of your **first name**: _____

Please write the first three letters of your **last name**: _____

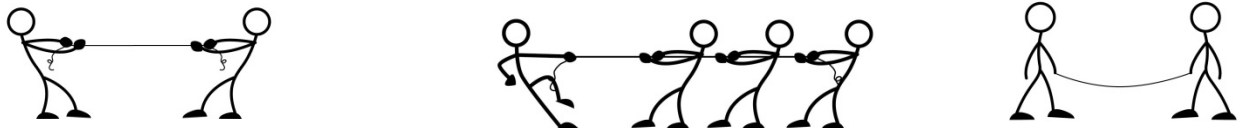
What is your birthdate? _____

What grade are you in? _____

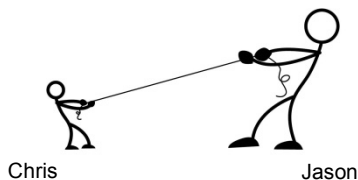
Instructions:

We are interested in learning how you think about science. Please read each question carefully and choose the best answer. This is not a test and it will not be graded. This test will help us understand how students like you think, so please do your best!

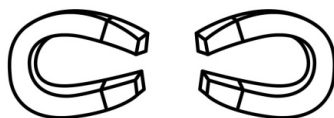
1. Circle the picture where the force is unbalanced.



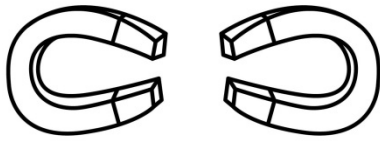
2. Jason has more force than Chris. If Jason pulls really hard, which way will Chris move? Draw an arrow to show your answer.



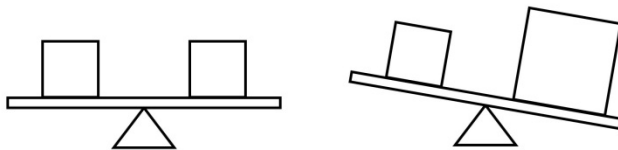
3. These magnets are attracted to each other. Draw arrows to show which way they will move.



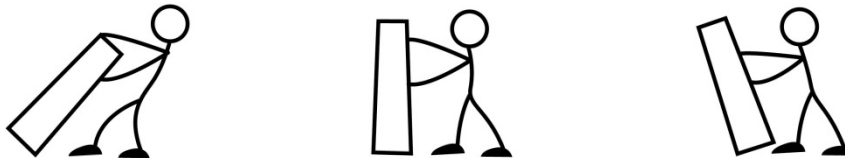
4. These magnets are repelled from each other. Draw arrows to show which way they will move.



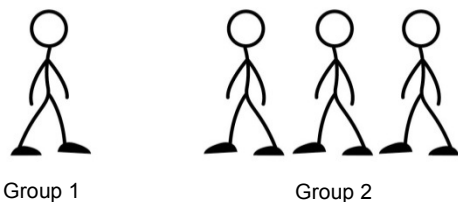
5. Which of these is a balanced force? Circle the picture that shows a balanced force.



6. Which picture shows force? Circle the picture or pictures that show force.



7. These two groups want to push a large box. Circle the group that will have the most force.





Science Content Survey: 2nd – 4th Grade

Background Questions:

Please write the first two letters of your **first name**: _____

Please write the first three letters of your **last name**: _____

What is your birthdate? _____

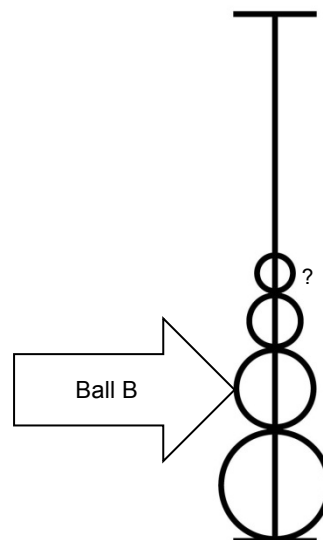
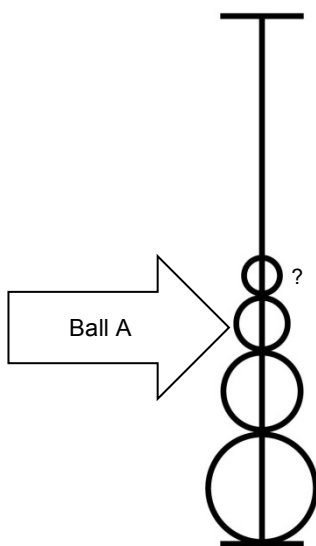
What grade are you in? _____

Instructions:

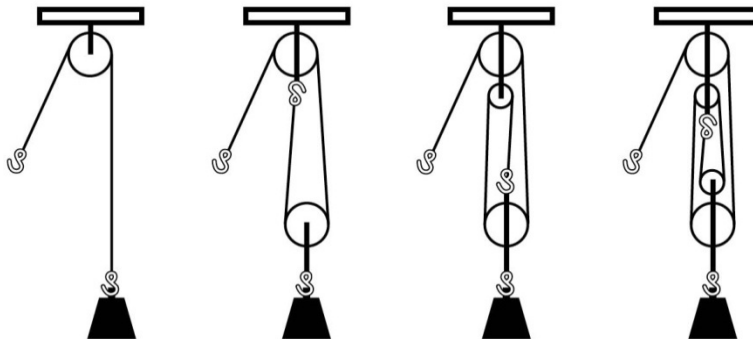
We are interested in learning how you think about science. Please read each question carefully and choose the best answer. This is not a test and it will not be graded. This test will help us understand how students like you think, so please do your best!

Let's get started!

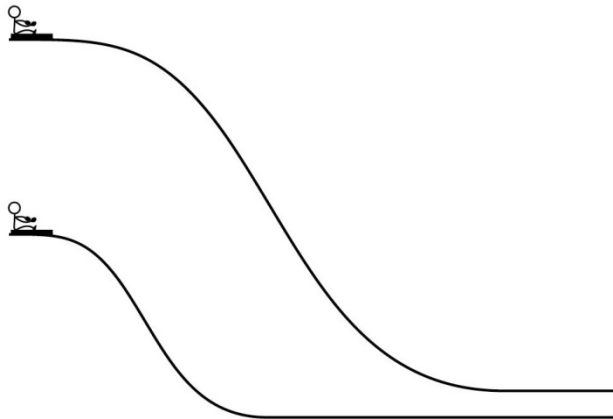
1. How high would the top ball go, if you lifted Ball A one centimeter and dropped it? What about if you lifted Ball B one centimeter and dropped it? Place an X where you think the balls would go in each picture.



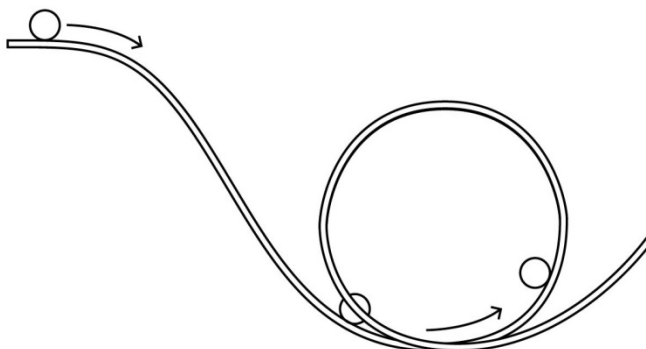
2. Which pulley makes it the easiest to lift a heavy load? Circle your answer



3. Which hill generates the most kinetic energy? Circle your answer.



4. Maria made a toy rollercoaster, but it isn't working and the ball cannot complete the loop. What changes can she make to make the rollercoaster work? How would the changes help?





Science Content Survey: 5th – 8th Grade

Background Questions:

Please write the first two letters of your **first name**: _____

Please write the first three letters of your **last name**: _____

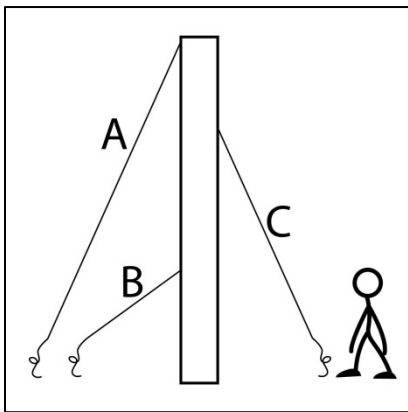
What is your birthdate? _____

What grade are you in? _____

Instructions:

We are interested in learning how you think about science. Please read each question carefully and choose the best answer. This is not a test and it will not be graded. This test will help us understand how students like you think, so please do your best!

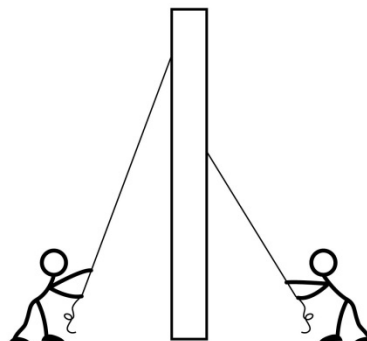
Let's get started!



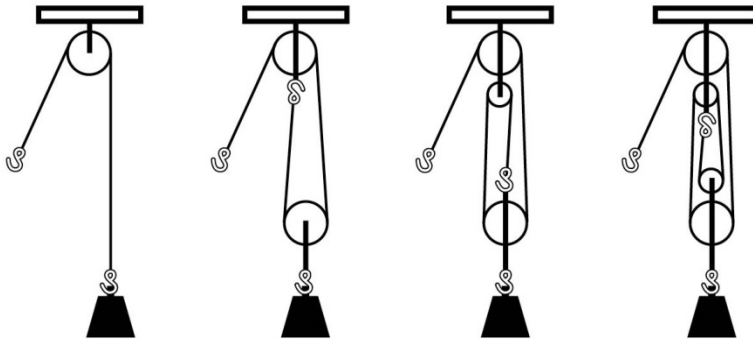
1. Which rope will have the most torque on the lever? Why?

2. Where should Sue pull to have mechanical advantage?

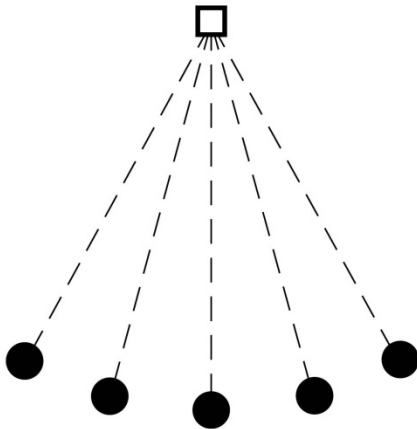
3. If both students use the same force, which way will the lever move? Draw an arrow to show your answer. Why will the lever move in that direction?



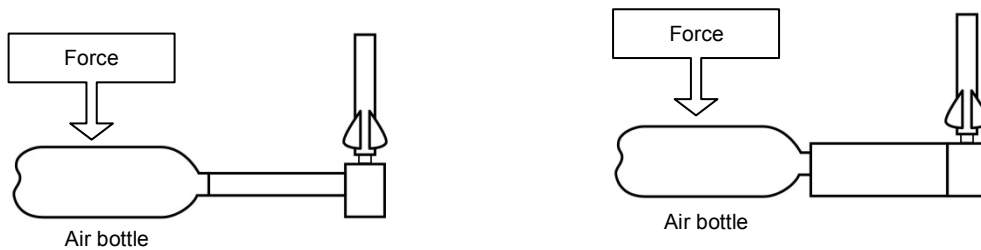
4. Which pulley system has the most mechanical advantage?



5. Where is the best place to push the pendulum to get the largest response? Circle your answer.



6. All things being equal, which rocket would fly the highest? Why?





Science Thinking Task: 5th – 8th Grade

All of the objects listed below make sounds. Put an X next to the objects you think involve vibrations in producing sound.

- guitar strings
- drum
- dripping faucet
- barking dog
- piano
- radio speaker

- wind
- clapped hands
- flute
- thunderstorm
- popped balloon
- singer



1. Explain your thinking. What rule or reasoning did you use to decide which objects involve vibrations in producing sound?

2. How would you find out or design an experiment to be sure that one of the objects involves vibrations in producing sound?

3. Can you draw a picture of your experiment to explain your answer?



Science Attitudes Survey by Grade Band and Construct

5th-8th grade and 2nd-4th grade:

Value of Science in Society

1. Science helps us solve problems in our lives.
2. Science is useful in understanding the world.

Desire to do Science/Science Curiosity

1. Science is something that I enjoy very much.
2. I would like to read books or watch television programs about science.
3. I would like to do science activities at home.
4. I would like to ask questions about science.

Self-concept of Science

1. Learning science is easy for me.
2. I cannot understand science even if I try really hard.

Anxiety toward Science

1. I feel tense when someone talks to me about science.
2. It makes me nervous to even think about doing science.

K-1st grade:

Value of Science in Society

1. Science helps us solve problems.
2. Science is useful.

Desire to do Science/Science Curiosity

1. I enjoy science very much.
2. I would like to read books about science.
3. I would like to do science activities at home.
4. I would like to ask science questions.

Self-concept of Science

1. Learning science is easy for me.
2. I have trouble understanding science.

Anxiety toward Science

1. I feel worried when someone talks about science.
2. Science makes me feel nervous.



Science Attitudes Survey: K – 1st Grade

Background Questions:

Please write the first two letters of your **first name**: _____

Please write the first three letters of your **last name**: _____

What is your birthdate? _____

What grade are you in? _____

Instructions:

Below is a list of statements about your attitude and behavior. Please show **how much** you agree or disagree with each statement by circling a face.

If you agree with a statement or like it, you should circle the happy face.

If you are not sure, you should circle the face in the middle that is not smiling or not frowning. If you disagree or do not like the statement, circle the unhappy face.

For each sentence, please circle the face that best describes *how much* you agree or disagree. There is no right or wrong answer, so please take your time and answer honestly.

Let's try some practice questions:

Pizza is one of my favorite foods.



I like to do chores at home instead of playing.



Let's turn the page and get started!

1. Science helps us solve problems.



2. Science is useful.



3. I enjoy science very much.



4. I would like to read books about science.



5. I would like to do science activities at home.



6. I would like to ask science questions.



7. Learning science is easy for me.



8. I have trouble understanding science.



9. I feel worried when someone talks about science.



10. Science makes me feel nervous.





Science Attitudes Survey: 2nd-8th Grade

Background Questions:

Please write the first two letters of your **first name**: _____

Please write the first three letters of your **last name**: _____

What is your birthdate? _____

What grade are you in? _____

Instructions:

Below is a list of statements about your attitude and behavior. Please show **how much** you agree or disagree with each statement by circling a word.

If you agree with a statement very much you should circle “DEFINITELY YES!!.” If you think you agree or just agree a little, or maybe you are not sure, you should circle a number closer to the middle by “yes.”

Do the same when you disagree, only choose “NO WAY!!” when you strongly disagree with the statement or just “no” when you disagree a little.

For each sentence, please circle the word that best describes *how much* you agree or disagree. There is no right or wrong answer, so please take your time and answer honestly.

Let’s try some practice questions:

Pizza is one of my favorite foods.

NO WAY!!	NO!	no	yes	YES!	DEFINITELY YES!!
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I like to do chores at home instead of playing.

NO WAY!!	NO!	no	yes	YES!	DEFINITELY YES!!
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Let’s turn the page and get started!



1. **Science helps us solve problems in our lives.**

NO WAY!!	NO!	no	yes	YES!	DEFINITELY YES!!
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2. **Science is useful in understanding the world.**

NO WAY!!	NO!	no	yes	YES!	DEFINITELY YES!!
----------	-----	----	-----	------	------------------

3. **Science is something that I enjoy very much.**

NO WAY!!	NO!	no	yes	YES!	DEFINITELY YES!!
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4. **I like to read books or watch television programs about science.**

NO WAY!!	NO!	no	yes	YES!	DEFINITELY YES!!
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5. **I like to do simple experiments at home.**

NO WAY!!	NO!	no	yes	YES!	DEFINITELY YES!!
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6. **I like to ask questions about science.**

NO WAY!!	NO!	no	yes	YES!	DEFINITELY YES!!
----------	-----	----	-----	------	------------------

7. **Learning science is easy for me.**

NO WAY!!	NO!	no	yes	YES!	DEFINITELY YES!!
----------	-----	----	-----	------	------------------



8. Even if I try really hard I cannot understand science.

NO WAY!!	NO!	no	yes	YES!	DEFINITELY YES!!
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9. I feel tense when someone talks to me about science.

NO WAY!!	NO!	no	yes	YES!	DEFINITELY YES!!
-------------	-----	----	-----	------	---------------------

10. It makes me nervous to even think about doing science.

NO WAY!!	NO!	no	yes	YES!	DEFINITELY YES!!
-------------	-----	----	-----	------	---------------------



Teacher Survey

Please take a few minutes to complete the survey below about your experience at the *Galvin Physics Forest* today. All of your responses are strictly confidential. We appreciate your feedback!

1. School name _____
2. Grade level(s) you teach _____
3. Years you have taught _____
4. Have you been to Kidspace before with a class/student group? Y / N
5. Why did you decide to bring your class here today?

6. What were you hoping your class would take away from the experience?

7. **Using a 1 to 5 rank scale**, with 1 being the most important, please rank the following items according to what you feel is most important for your students to get out of the Physics Forest experience. If an item is not at all important, please use n/a.

_____ Learn science concepts

_____ Develop a positive attitude toward science

_____ Practice social skills including teamwork and collaboration

_____ Have the opportunity to problem solve and/or think critically

_____ Develop physical or motor skills through interactions with the exhibits

Please turn survey over



Please check the box that most closely matches your opinion.	Not at all 1	A little 2	Some- what 3	Very much so 4
8. To what extent did the experience today align with what you are teaching?				
9. To what extent were you satisfied with your experience?				

10. Please explain your response(s) (*optional*).

For questions 11-16, please think about the Discovery program that was led by Kidspace Educators. If you did not participate in a Discovery program, please skip to question 17.

Please rate the extent to which you agree that the following aspects of the program were successful.	Not at all 1	A little 2	Some- what 3	Very much so 4
11. Appropriateness of content for age group				
12. Length of Discovery				
13. Effectiveness of delivery by educator				
14. Overall hands-on approach to content				
15. Effectiveness of Discovery for increasing students' understanding of physics concepts				

16. Please explain your response(s) (*optional*).



For questions 17-25, please think about the Galvin Physics Forest program in its entirety (e.g., exhibits, Discovery sessions, Kidspace educator-led demonstrations, etc.).

Please rate the extent to which Physics Forest impacted your students in the following areas:	Not at all 1	A little 2	Some- what 3	Very much so 4
17. Positive attitude towards science				
18. Interest in physical science				
19. Knowledge of physical science principles				
20. Ability to problem solve and/or think critically				
21. Develop physical skills (e.g., balancing, fine motor skills)				
22. Develop social skills such as group collaboration and team work				
23. Understanding of the real-world applications of physical science				
24. Student learning of physical science concepts				

25. Please explain your response(s) (*optional*).

26. Please provide any other comments you have.

Thank You!



Program Observation Protocol

Observations are designed to capture the whole-group experience and are to be completed during specified moments such as activities during Discoveries, free play, or Explorations. Indicators of students' informal learning are categorized into areas that align with outcomes specified in the program logic model. Because opportunities for some categories of indicators may be limited with certain activities, we specify which indicator categories are applicable for which activity.

Background information

- School name
- Date of observation
- Grade level of group
- Activity observed
 - Discovery/activity (ex. *K-1st Motion and Force, Magnets*)
 - Free play in Physics Forest (ex. *Students at Wheel Roll*)
 - Exploration
- Type of adult guidance
 - Kidspace educator
 - Teacher
 - Adult Chaperone
 - None
- Number of participating students

Observer: Rate each indicator on a scale of 1 to 5, with 1 = Not at all to 5 = Very Much. Please circle N/A if indicator was not applicable and/or no opportunity was provided for observation.

Social Skills (All Activities)

- There is a climate of respect for students' ideas, questions, and contributions.
- Students work effectively with each other.
- Students communicate with each other with respect.
- Students share materials, take turns

Please explain your response(s) (optional):

Positive Attitudes Towards Science (All Activities)

- Students are excited and enthusiastic about science
- Students express wonder and fascination about science
- Students are interested and engaged in science

Please explain your response(s) (optional):



Scientific Thinking Skills (Free play Activity only)

- Students infer, problem solve, make predictions on their own
- Students make connections to real world, classwork, or related content area.
- Students raise questions
- Students engage in hands-on experimentation
- Students discuss rigorous content with educator/teacher/peer

Please explain your response(s) (optional):

Scientific Thinking Skills (Discovery or Exploration activities only)

- Students make predictions when prompted
- Students make connections to real world, classwork, or related content area when prompted
- Students raise questions to educators
- Students discuss rigorous content with educator/teacher/peer

Please explain your response(s) (optional):

Student Engagement (Discovery or Exploration activities only)

- Students respond as part of a group or individually to educator prompts that demonstrate basic understanding
- Students perform appropriate manipulation of specified objects
- Students listen attentively
- Students work actively on task
- Students follow directions

Please explain your response(s) (optional):

Optional: Provide any additional comments about observed activity that were not covered earlier, such as adult interactions with students, educator delivery of material, extenuating circumstances, program challenges and/or highlights, etc.

