



Curtis Kinetic Science Competition Virtual Rules 2021

Goal: Teams build a kinetic system with multiple energy transformations. The system may be free-standing and designed for a table top. All purchased parts for the system must not exceed \$100 and any found object may not exceed \$20. The system should not exceed 30 inches deep, 72 inches wide, and 108 inches high (as measured from the floor). Each member of the team will participate in the oral explanations to the judges. All entries will be judged on:

- The kinetics used
- Presentation skill and explanation of the science behind their creation
- Reliability: running the system initially successfully within 3 tries (during final judging)
- Being able to reset the system within 5 minutes and run it again multiple times
- Innovation: creating a new system or changing an existing system in a creative and innovative way
- Project Portfolio with proof of purchases and budget documentation.

Note

- Projects may not exceed the measurements of 30"x72"x108"
- Projects may not exceed the budget of \$100
- Machine run videos may not be edited

COMPLETE A TEAM PORTFOLIO

MUST INCLUDE:

1. Team photo
2. Team name, lead educator and team information
3. SYSTEM BLUEPRINT: 1 page image of the plan for your design
4. OUR STEP LIST: A Step list (3 pages maximum)

CLARIFYING WHAT A STEP LIST IS:

List needs to be in order and accurate.

Simple Machines must be highlighted **IN BOLD CAPS**.

Specifically point out the transfer of motion like this example:

1. The marble rolls down the **INCLINED PLANE** and pushes a car. (marble to car)
2. The car pushes a weight off a ledge. (car to weight)

5. **OUR CLOSE-UPS: PHOTOS:** A maximum of 3 close-ups (scanned diagrams, photos).

6. **OUR CLOSE-UPS: FAVORITE STEP:** A close-up video of your favorite step sequence.

7. **OUR MACHINE THEATRICAL/VERBAL PRESENTATION:** A great Kinetic System tells a story. And the story is introduced through an entertaining verbal presentation. Note: this should not be a step by step explanation of how transfers of energy work. (2 minutes maximum)

Possible Topics to Discuss in Your Presentation:

- Scientific Principles used
- Procedure Test runs made
- Analysis/Discussion
- Conclusions
- Questions answered through experimentation
- Experimental procedure for testing scientific principles used
- Solved problems arising with procedure
- Original approach or technique

8. **OUR MACHINE RUN VIDEO #1** - 3 minutes maximum run time

9. **OUR MACHINE RUN VIDEO #2** - 3 minutes maximum run time

HOW TO FILM YOUR KINETIC SYSTEM

Each video must be a single continuous view of **TWO DIFFERENT** machine runs. These may **NOT** be two videos of the same machine run from different angles. The machine run videos must have the machine in view at all times with **NO** video editing or breaks. Any evidence of editing will result in disqualification.

The following items are prohibited:

- Explosive or effervescent chemicals (including soda and mentos)
- Balloons
- Live Animals

Creating your System • Consider all competition criteria. • Make a blueprint to follow as you create your structure. • Mark the energy transfers! • Use sturdy material for the base of your system and consider the material properties of each components. • Decide on an orientation, vertical or horizontal. • Use a level! Levels will help you set up your base the same way each time, and help set each component. • Consider how each component will be fixed to the board, create strong, secure fixture points. Pay special attention to the energy transfer points!

Testing and Improving your System • As you build your system, test, test and retest! • Use a level to mark angles and to ensure the base is still level. • If there are items that need permanently adhered to the board, create a strong bond. • As you test the system, pay attention to those energy transfers, keep improving until you are satisfied with the results again and again. • Practice moving and rebuilding your design. • Create a final blueprint to reference on competition day.

Interview Day • If you are moving your Kinetic System, pack your design safely so nothing is bent, broken, or shifts during the ride. • Use a level and the blueprint to rebuild your design at your interview location. • Test and make adjustments before your interview time with the judges.

Judging • Be familiar with how to talk about the energy transfers; have an outline and decide who will talk about which parts. • Be prepared for the judges to stop you and ask questions during the interview.

A Note from our Sponsors:

Dear Participants,

Welcome to the Curtis Kinetic Science Competition. We hope that we have motivated you to stretch the capacity of your imaginations and then transform ordinary and found objects into a kinetic system. We want you to have fun and learn the science behind the system. The rules of the competition introduce you to some of the requirements you would encounter in the future in county, state or international science and engineering fairs. We hope this competition encourages you, in a fun way, to pursue more science, technology, engineering, and mathematics opportunities.

The judges and competition staff are here to help you succeed. Among you are the scientists and engineers of the future who will make significant progress for our lives and our country. We hope this event is both fun and a learning experience for you.

Thank you for your hard work and have fun!

Sincerely,

Fred and Gayle Curtis