CLIXO
Classroom

The Clixo Ball Run

Activity Guide

Online Activity Page

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Objective

Students will design and build a ball run using Clixo pieces, exploring concepts of physics, engineering, and creativity. The activity encourages problem-solving, collaboration, and understanding of gravity, momentum, and angles.

Materials for Each Student

- Clixo sets with various pieces (enough for small groups)
- Small balls (e.g., marbles or ping pong balls)
- Measuring tape or ruler
- Stopwatches (optional)
- Paper and pencils for planning
- A metallic flat surface or wall to build the ball run against

Ages

Grades 1-2, 3-5

Duration

1-2 hours

Skills

- Understand basic principles of physics, including gravity, force, and momentum.
- Develop engineering skills by designing and constructing a functional ball run.
- Encourage creativity and innovation in problem-solving.
- Foster collaboration and teamwork among students.



Introduce

1. Introduction (15 minutes)

- **Discussion:** Start with a brief discussion on what a ball run is and how gravity and angles affect the speed and direction of a ball. Explain that the objective is to create a ball run where the ball moves smoothly from start to finish without falling off.
- **Show Examples:** If possible, show a video or images of different ball runs to inspire students.

2. Planning Phase (15-20 minutes)

- **Group Formation:** Divide the students into small groups (3-4 students per group).
- **Brainstorming:** Each group should brainstorm ideas for their ball run. Encourage them to think about what objects to connect their Clixo ball-run to (table, chairs, door, whiteboard), how the ball will travel from start to finish and how they can use different Clixo pieces to guide its path.
- **Sketching:** Have students sketch their ball run design on paper. This plan will guide them during the building phase.



Build & Create

3. Building Phase (30–45 minutes)

- **Constructing the Ball Run:** Groups will use Clixo pieces to construct their ball run based on their designs. They can adjust and modify their structures as needed.
- **Testing and Iteration:** After constructing the initial run, students should test it by rolling a ball through. If the ball doesn't make it to the end or falls off, encourage them to problem-solve and make adjustments to improve the run.



Share & Reflect

4. Group Presentations and Reflection (15–20 minutes)

- **Presentations:** Each group will present their ball run to the class, explaining the design choices they made and any challenges they encountered.
- **Class Discussion:** Facilitate a discussion on what worked well and what could be improved. Ask questions such as:
  - What did you learn about how angles affect the ball's speed?
  - How did your team solve any problems that came up?
  - What would you do differently next time?



Extension Activities

TIME TRIALS

Use a stopwatch to time how long it takes for the ball to travel through each group's run. Discuss how different designs affect speed.

DESIGN CHALLENGES

Challenge students to modify their ball runs to make the ball go slower, faster, or travel a longer distance.

REAL-WORLD CONNECTIONS

Discuss how the principles learned in this activity apply to real-world engineering, such as roller coasters or water slides.

Tips

- **Assessment – Participation:** Observe students' engagement during the activity and their ability to work collaboratively in their groups.
- **Assessment – Design and Construction:** Evaluate the functionality and creativity of the ball run designs.
- **Assessment – Reflection:** Assess students' ability to articulate their learning during the presentation and class discussion.
- **Differentiation – For Younger Students (Grades 1–2):** Simplify the activity by focusing on building a straight or slightly angled run, emphasizing the basics of gravity and motion.
- **Differentiation – For Older Students (Grades 4–5):** Introduce more complex challenges, such as incorporating turns, loops, or multiple paths in the ball run.

Educational Standards

ISTE STANDARDS FOR STUDENTS

Empowered Learner (1a, 1d)
Students articulate and set personal learning goals, develop strategies leveraging technology to achieve them, and reflect on the learning process itself to improve learning outcomes. Students demonstrate perseverance to solve problems by working to achieve their learning goals.

Creative Communicator (6a, 6d)
Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
Students publish or present content that customizes the message and medium for their intended audiences.

Innovative Designer (4a, 4b, 4c)
Students use a variety of technologies within a design process to identify and solve problems by creating new, useful, or imaginative solutions. Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks. Students develop, test, and refine prototypes as part of a cyclical design process.

CCSS ENGLISH LANGUAGE ARTS STANDARDS

CCSS.ELA-LITERACY.SL.1-5.1
Participate in collaborative conversations with diverse partners about grade 1–5 topics and texts with peers and adults in small and larger groups.

CCSS.ELA-LITERACY.SL.1-5.5
Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.

CCSS MATHEMATICS

CCSS.MATH.CONTENT.1.MD.A.1
Order three objects by length; compare the lengths of two objects indirectly by using a third object.

CCSS.MATH.CONTENT.3.G.A.1
Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals).

CCSS.MATH.CONTENT.5.MD.C.4
Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

CCSS.MATH.CONTENT.2.MD.D.9
Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object.

CCSS.MATH.CONTENT.4.MD.A.2
Use the four operations to solve word problems involving distances, intervals of time, and money, including problems involving simple fractions or decimals.