

Curriculum topics:

- Engineering
- Urban Design
- Problem Solving
- Design Process
- Collaboration

Subjects:
Mathematics, Art,
Language Arts,
Physical Science

Grade range:
Pre-K - 2

Who we are:

Resource Area for Teaching (RAFT) helps educators transform the learning experience through affordable “hands-on” activities that engage students and inspire the joy and discovery of learning.

For more ideas and to see RAFT Locations

www.raft.net/visit-raft-locations

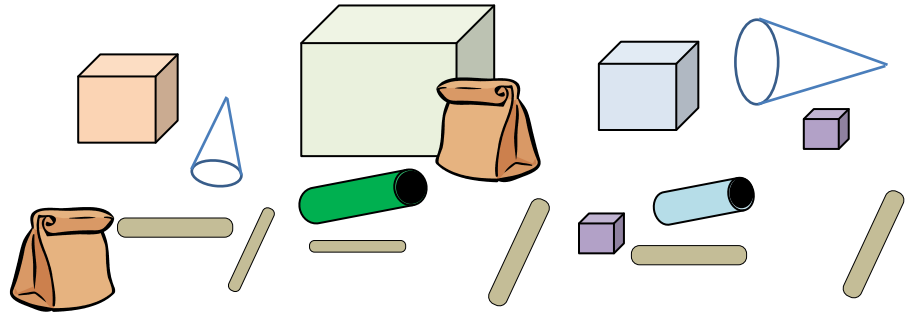
In collaboration with:



**JUNIOR LEAGUE
OF SAN JOSE**
Women building better communities®

DESIGN A TOWN

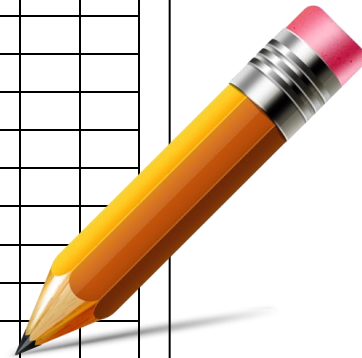
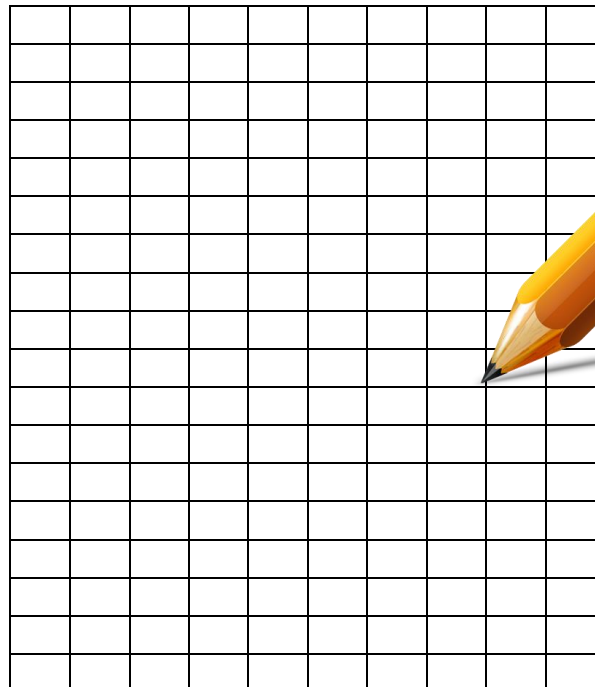
Create a dream town!



Working together, students design and build a town using different types of materials. In this process, students will explore the elements of town development.

Town Plan

Town name: _____



Materials required

(For a group of 2- 4 students):

For town planning:

- Graph paper, 5 sheets
- Ruler
- Pens and/or colored pencils, crayons, and markers
- Brainstorming worksheet (download at <http://www.raft.net/raft-idea?isid=747>.)

For town building:

- Craft sticks, Extra Jumbo, or paint sticks, 12
- Craft sticks, jumbo, 12
- Craft sticks, regular, 12
- Paper bags, small (lunch-sized), 4
- Cone cups, paper, 12

- Cones, cardboard, 12
- Boxes, small, 4
- Boxes, Medium, 4
- Boxes, tiny, 4
- Cardboard tubes, small, 4
- Stickers, shapes
- Glue or double-sided tape
- Scissors
- Optional: Colored and or patterned paper
- Optional: Plastic containers in a variety of sizes, and/or other suitable building materials



To do and notice

Facilitating the Project Based Learning Process:

Depending on the needs of the class & students, each phase can be used as stages in a lesson that happens over time. For example: phase one can happen on Monday and phase two on Tuesday, etc. If needed, a single phase can occur over multiple days.

1

Phase 1: Brainstorm (as a group)

- Brainstorm the elements of a town using the brainstorm worksheet.
- Decide what will be included in the town.

Teaching Tip – Optional: Depending on the students' level, during Phase 1, pose one or more potential problems that the town might face. For example: What if there is a fire? Where will people buy food?

2

Phase 2: Design a town (as a group)

- Design desired town layout using graph paper. Include non-building elements such as roads, trees, etc.
- Agree on who will build which building(s) and elements.

3

Phase 3: Design structures (as individuals or pairs)

- Each student makes a design of their chosen buildings.
- Students pick out the materials needed to create the structure. See RAFT idea sheet ***Design a House*** for more details on this process.

4

Phase 4: Create structures (as individuals or pairs)

- Examine the chosen building materials.
- Build structures.

5

Phase 5: Create the Town (as a group)

- According to the initial design, arrange the structures on a flat surface.
- Name the town.
- Develop a history for the town, including how it was created.
- Present the town to the class, parents, other classes, and/or the community.

The content behind the activity

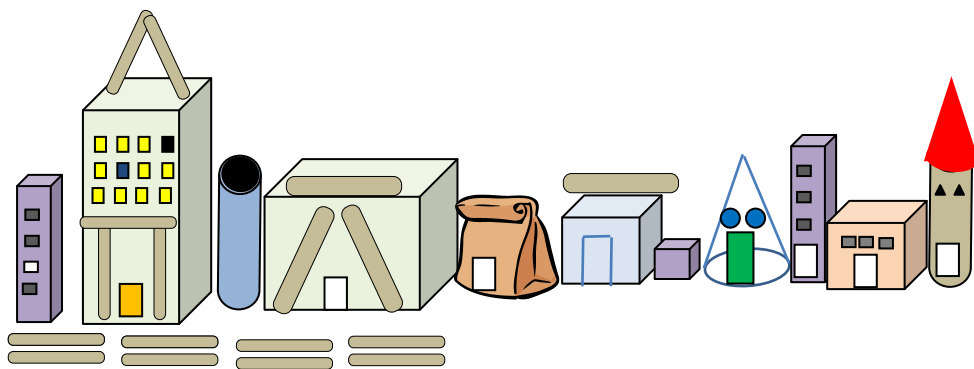
Project Based Learning (PBL) projects take place over time. Students engage in effective and enjoyable learning opportunities, developing the deeper learning competencies required for success in college, career and civic life. True PBL naturally provides opportunities for students to engage in math, science, and engineering practices, which include the 4 C's:

- Collaborating- Working together to create a town.
- Communicating- Sharing what they know and asking question about what they do not know.
- Critical thinking- Looking at the problems that town may have and find the solution.
- Creating- Creating a town using the resource available.

In the initial design phases students use critical thinking skills. This activity provides the students the opportunity to act as planning engineers. Students develop stronger cognitive skills when using engineering processes.

In this activity students are starting the building process by solving the problem of building a town with limited resources. Students can use their past experiences to make their design.

With its initial emphasis on brainstorming, the ***Design a Town*** activity gives students experience sharing their ideas and listening to the ideas of others with respect and deferred judgement. This process allows students to have a real hands-on experience in collaboration.



Curriculum Standards:

Gross Motor & Fine Motor Skills
(Early Education: Desired Results Dev. Profile (DRDP-R 2010), Physical Development, 38 & 40)

Problem Solving, Memory & knowledge, Curiosity & initiative, Engagement/persistence
(Early Education: Desired Results Dev. Profile (DRDP-R 2010), Cognitive Development, 28, 29, 30, & 31)

Shapes and Patterning
(Early Education: Desired Results Dev. Profile (DRDP-R 2010), Mathematical Development, 36 & 37)

Problem Solving and Reasoning
(Common Core Math Standards: Math Practices Grades K - 2)

Science & Eng. Practices
(Next Generation Science Standards: Grades K – 2)

Conversation
(Common Core English Language Arts Standards: Grades K-2, Speaking & Listening, 1)

Presentation of Knowledge and Ideas
(Common Core English Language Arts Standards: Grades K-2, Speaking/Listening, 4-6)

Creativity & innovative thinking, (National Visual Arts Standards: Creating – Generate and conceptualize artistic ideas and work, Grades Pre K-2)

Experiment with forms, structures, & materials,
(National Visual Arts Standards: Creating – Organize and develop artistic ideas and work, Grades Pre K-2)

Learn more

- Use additional types of materials such as straws or circle wood pieces.
- Provide students with a town construction budget and prices for the materials. Students must make choices based on cost.
- Students discuss how their town will be governed and make community decisions (e.g., town council, mayor)

Related activities: See RAFT Idea Sheets:

Design a House –

<http://www.raft.net/ideas/Design a House.pdf>

Leonardo's Arched Bridge -

<http://www.raft.net/ideas/Leonardos Arched Bridge.pdf>

Shape Fun -

<http://www.raft.net/ideas/Shape Fun.pdf>

Resources

Visit www.raft.net/raft-idea?isid=747 for “how-to” video demos & more ideas!

See these websites for more information on the following topics:

- **Math related teacher resources -** <http://www.nctm.org/>
- **California Preschool Curriculum Framework –**
<http://www.cde.ca.gov/sp/cd/re/psframework.asp>
Initiative in Learning - Volume 1, pages 57-59
Patterning - Volume 1, page 264-265
Shapes - Volume 1, page 284-285
- **California Preschool Learning Foundations –**
<http://www.cde.ca.gov/sp/cd/re/psfoundations.asp>
Initiative in Learning - Volume 1, page 10
Patterns - Volume 1, page 154
Geometry - Volume 1, page 157

Acknowledgements:

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