

## LEARNING STANDARDS:

### Junk Box Wars--IL Standards

#### Illinois Learning Standards related to the Junk Box Wars projects:

*STATE GOAL 11: Understand the processes of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems.*

Standard B. - Know and apply the concepts, principles, and processes of technological design.

11.B.3a. Identify an actual design problem and establish criteria for determining the success of a solution.

11.B.3b. Sketch, propose and compare design solutions to the problem considering available materials, tools, cost effectiveness, and safety.

11.B.3c. Select the most appropriate design and build a prototype or simulation.

11.B.3d. Test the prototype using available materials, instruments and technology and record the data.

11.B.3e. Evaluate the test results based on established criteria, note sources of error and recommend improvements.

11.B.3f. Using available technology, report the relative success of the design based on the test results and criteria.

*STATE GOAL 13: Understand the relationships among science, technology and society in historical and contemporary contexts.*

Standard B. Know and apply concepts that describe the interaction between science, technology and society.

13.B.3a. Identify and explain ways that scientific knowledge and economics drive technological development.

13.B.3c. Describe how occupations use scientific and technological knowledge and skills.

NOTE: Sections of State Goal 12 related to physical science will also be addressed depending on the project.

#### The Junk Box Wars projects also address the National Science Education Standards related to the technological design.

##### *ABILITIES OF TECHNOLOGICAL DESIGN*

###### **• IDENTIFY APPROPRIATE PROBLEMS FOR TECHNOLOGICAL DESIGN.**

Students should develop their abilities by identifying a specified need, considering its various aspects, and talking to different potential users or beneficiaries. They should appreciate that for some needs, the cultural backgrounds and beliefs of different groups can affect the criteria for a suitable product.

###### **• DESIGN A SOLUTION OR PRODUCT.**

Students should make and compare different proposals in the light of the criteria they have selected. They must consider constraints--such as cost, time, trade-offs, and materials needed--and communicate ideas with drawings and simple models.

###### **• IMPLEMENT A PROPOSED DESIGN.**

Students should organize materials and other resources, plan their work, make good use of group collaboration where appropriate, choose suitable tools and techniques, and work with appropriate measurement methods to ensure adequate accuracy.

###### **• EVALUATE COMPLETED TECHNOLOGICAL DESIGNS OR PRODUCTS.**

Students should use criteria relevant to the original purpose or need, consider a variety of factors that might affect acceptability and suitability for intended users or beneficiaries, and develop measures of quality with respect to such criteria and factors; they should also suggest improvements and, for their own products, try proposed modifications.

###### **• COMMUNICATE THE PROCESS OF TECHNOLOGICAL DESIGN.**

Students should review and describe any completed piece of work and identify the stages of problem identification, solution design, implementation, and evaluation.