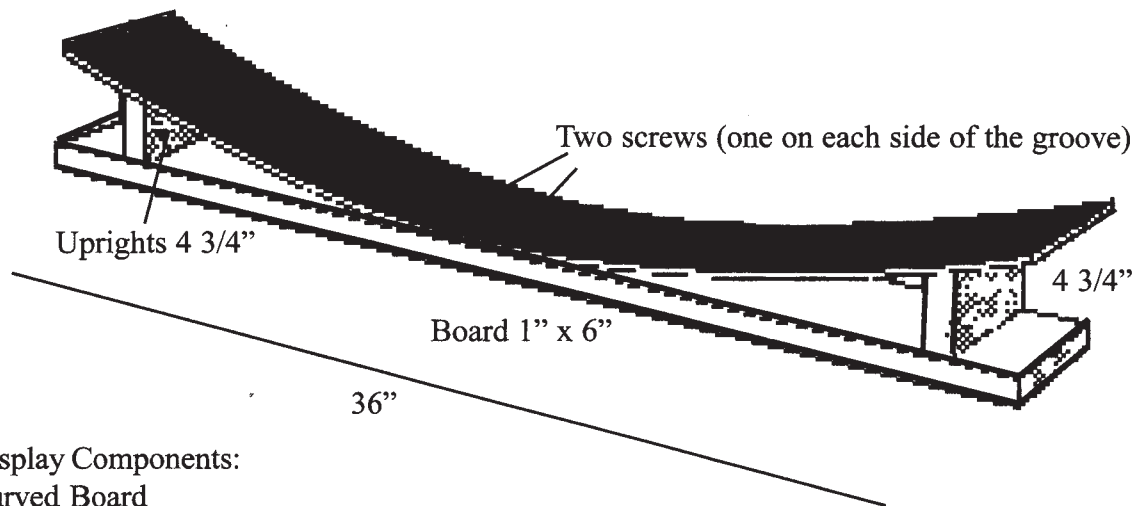




# Mass Force Display

Flexible Board with Groove (plastic 1/4" thick)



**Display Components:**

- Curved Board
- 4 marbles (2 small and 2 large)

Working with animals, especially large ones, can lead to dangerous situations. While most animal incidents are not fatal, they often result in broken bones, crushed and mashed limbs, missed work days and needless medical costs. Many incidents occur because of haste, impatience, anger at another person or object, or because of a preoccupied mind.

**Mass Force (really Momentum) Demonstration**

This demonstration will show what might happen when a person comes in contact with a large animal. It is appropriate for preschool up through elementary age children, increasing the complexity of the concepts as children get older.

**Explanation**

Show marbles. The bigger ones represent large animals such as horse, cow, bull, or sow and weighs oz.. The smaller one weighs .1 oz. each and represents a child. Have the audience compute the size relationship (.6 divided by.1). This tells them that the animal would be six times larger than the child. Explain that this relationship would probably be even greater in real life. Example: A 1000 lb. person is very reasonable.

Explain that the momentum created by the rolling marble on the downward curve represents moving animals and people. Set one marble at each end of the demonstration in the groove, releasing the marbles at the same time. First, use the two smaller marbles. They should collide in the middle and both roll back up the groove approximately the same distance. This represents two people about the same size. Next, do the same thing with the bigger marbles representing two animals. You should have the same results. The third time, use one small marble (person) and one





## Mass Force Display-cont.

large marble (animal). The bigger marble should knock the smaller one off the board. Emphasize the direction of each of the marbles upon impact. Try the demonstration several times to allow all the kids to see well and reinforce the concept.

### Ask the following questions:

- What was the difference in the demonstrations?
- Which marble was more likely to stay in the groove?
- How far did the small marble (child) fly?
- Who is more likely to be able to stay in the groove-an adult or a child?

### Other key points to discuss.

#### Animals are more likely to put their handlers at risk when:

- Mother animals with young
- Unfamiliar animals
- Frightened or startled animals
- Environmental changes such as weather, temperature, humidity, etc.
- Change learned behavior such as feeding schedule
- Change in care givers
- Change in territory

### Additional Handling Tips:

If your audience is old enough to start handling animals the following guidelines will promote further discussion. The extension office will have additional material.

- Beef and dairy cattle are generally color blind and have poor depth perception, making them extremely sensitive to contrasts. A shadow may look like a deep hole to the animal. This is why cattle often hesitate when passing through unfamiliar gates, barn doors, or chutes.
- Farm animals have difficulty moving from dark places to brightly lighted places, and vice versa. Give animals time to adjust from one light situation to another. Rushing them will cause them to balk.
- Cattle have good hearing and will try to move away from the direction or source of unfamiliar or unpleasant noise. They are calmest when surrounded by familiar sounds.
- Animals draw on past experience when reacting to a situation, so animals that are chased, slapped, kicked, hit, or mistreated will have a sense of fear around humans.
- Plan out the process of moving an animal before the first attempt.
- Use a restraining chute to handle animals at close range to reduce risk of injury.