

Bendable Action

Leader Guide



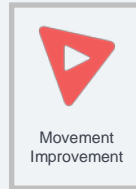
Fashion
through science

WITH THIS ACTIVITY

- Handout



We are
Engineers!



Movement
Improvement



Marvelous
Materials



Smart
Clothing



Patternmaking
Tools n' Tech

MODULE

Big Picture

Young designers learn how different pattern shapes can enable/inhibit movement.

What's the goal?

By the end of the activity they are able to apply those ideas to create a pant leg out of Tyvek[®] that does not limit mobility.

Preparation

Create three example pant leg “solutions”:

1. Pleated Tyvek[®] – Fold a 9 X 9” piece of Tyvek like an accordion. Tape both sides to secure the pleats.

2. Cut up Tyvek[®] – Cut horizontal slashes in a 9 X 9” piece of Tyvek[®], leaving 1-2” margins on either side.

(Tip: A honeycomb pattern of lots of little slits does not make big holes but allows lots of stretch.)

3. Spandex Knit – Cut a 9 X 9” piece of spandex fabric.

Materials

What they need: (per group)

- 1 Tyvek rectangle:
 - Suggestion: 26”x 20” rectangle
- Duct tape
- Safety pins
- Scissors
- Tape measure
- Sticky dots
- Ruler
- Smaller pieces of a variety of fabrics

What you need:

- Three example pant leg “solutions”
 - 9”x9” Knit with spandex
 - 9”x9” Tyvek - pre-pleated
 - 9”x9” Tyvek - slashed
- Step ladder; can substitute stairs

Prep Time: 30 Minutes

Activity Time: 1 Hour

Difficulty: Level 1



VOCABULARY

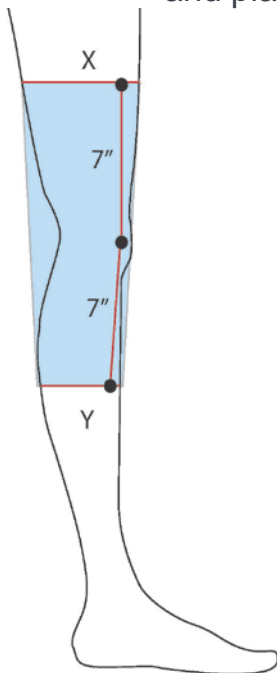
Mobility: Mobility, or ease of body movement, is affected by fabric flexibility and elasticity; garment cut, fit, fabric weight; and the friction of the garment against the skin or other garments.

Grouping

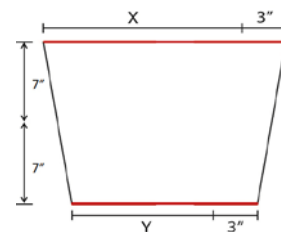
Young designers work in groups of three.

Let's get started!

1. Have the young designers make groups of three. Have them designate two people to be designers and one to be the subject.
2. Have the designers create a pant leg as follows.
 - Place a sticky dot on the subject's kneecap. Measure up 7" from the dot and place a second dot. Measure 7" down from the knee and place a third dot.



- Measure the circumference of the subject's leg at the top dot and add 3". This is the measurement for the top of the pant leg (X). Then measure the circumference of the leg at the bottom dot and add 3", for the measurement for the bottom of the pant leg (Y).
- Have each team draft one pant leg on the Tyvek[®] and cut it out. Tape the leg to create a tube.



3. Have the subject try on the pant leg. Tape securely to the subject's leg/clothes. Have the subject step up on the ladder or step to test range of movement.

VOCABULARY

Pleats: Pleats are fabric folds that expand to add mobility. Pleats control the extra fabric – when you move the pleats expand to allow more movement.

Gathers: Gathers are similar to pleats as they add extra fabric in a controlled way. Gathers are made by scrunching up a large piece of fabric, often by pulling it in along a line of stitching, to add extra volume. The main difference between pleats and gathers is that gathers are smaller and more randomly placed.

- **Discussion Point** - How easy or hard is it to move the knee in this pant leg? Can the subject lift that leg onto a high step?
- 3. Bring out the three “solution” samples and show the teams how each one allows for movement, by pulling the edges of the fabric to open the pleats or slits and to stretch the spandex. Explain how the movement is accommodated by making pleats, slits, or using stretch fabric.
- 4. Have the teams brainstorm their own solutions. Encourage the teams to mix and match the “solutions” or come up with their own ideas to modify the tight-fitting pant leg and allow movement! There is space on the handout for them to brainstorm ideas with sketches or written descriptions.
- 5. Once they are done brainstorming ideas, have them try to create their pant legs. This should be a process of rapid prototyping so encourage experimentation! Have them use tape and pins to insert their solution into the pant leg.
 - **Tip:** Cut only the front and/or the back of the pant leg to try to keep its integrity.
- 6. Designers should consult with the subject about their comfort and range of motion as they go along.
- 7. After creating the designs, have the subject slip on the pant leg with the knee at the center, and tape it to the subject’s leg/clothes. Be sure to tape it tightly at both the thigh and calf. Revise the design as necessary to get a comfortable fit when the pant leg is taped around the subject’s leg.

8. Have the subjects come to the front of the room so everyone can see each team's solutions. Have each one step on the ladder (one step at a time with the other foot on the ground) to see the range of motion (e.g. one step = limited mobility, but 3 steps = full mobility). Rank the designs from most mobile to least mobile.

Wrap it Up

1. Discuss the pros and cons of each design solution.
 - a. What are some of the design solutions you tried?
 - b. What worked? Why and why not?
 - c. Were you surprised that pleats, slits, or stretch fabrics could make so much difference?
2. The ideas you generated answered the “What are some ideas to fix the problem?” of the EDP! Good Job!

Take it Further

Show some clothing with pleats, gathers, stretch inserts, and slits as examples of ways apparel designers have approached the problem of permitting close fit while allowing body movement in commercial garments. Athletic apparel and outerwear are good places to look for these functional design details.