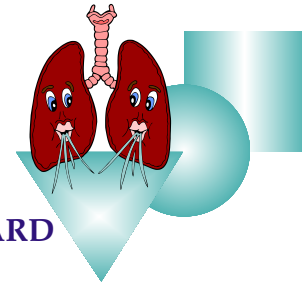


## Pulmo-Park Pom-Pom Shooter: Measuring the Effect of Restricted Breathing on Peak Expiratory Flow (PEF)



### STATION ONE: MEASURING PEAK FLOW INSTRUCTION CARD

#### Station One: Measuring Peak Flow

Supplies needed:

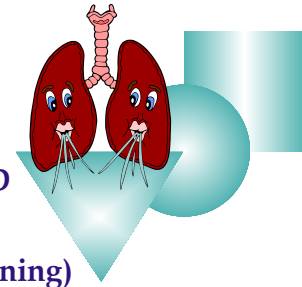
- Peak Flow Meter (if not available, laminate and use the *Peak Flow Nomogram* included in the *Teacher Information Pages* following this card)
  - Mouth pieces
  - Nose clips
  - *Station Instruction Card*
  - 250 ml Beaker (for cleaning non-disposable mouth pieces and noseclips)
  - 100 ml Isopropyl Alcohol
  - Paper towels
1. To use the *Peak Flow Meter*:
    - a. Find the arrow on the *Peak Flow Meter*. This is the side where the mouth piece is attached. The mouthpiece is tapered. The larger side goes into the meter.
    - b. Make sure the sliding indicator is at zero.
    - c. Clip a nose clip on your nose. Use this clip through all the stations and turn it in to the teacher at the end of the lab for cleaning.
    - d. While standing, inhale as deeply as possible. Insert the mouthpiece past the teeth and surround the mouthpiece with your lips forming a tight seal.
    - e. Blow out as *hard* and *fast* as possible. This effort will be indicated on the scale. *Attempting to exhale longer will not make the indicator move.*
    - f. The final position is your *PEF* (Peak Expiratory Flow). Record this value in *Data Table 1*.
    - g. Repeat steps a-g two more times recording the value each time on the data chart. It is best to wait at least one minute between each measurement so take turns in your group.
    - h. Choose the *highest (do not average)* of the three readings in *Table 1* as your PEF.
    - i. Wash and dry the mouthpiece with alcohol.

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LESSON 5  
ACTIVITY 5D

## Pulmo-Park Pom-Pom Shooter: Measuring the Effect of Restricted Breathing on Peak Expiratory Flow (PEF)



### STATION TWO: MEASURING UNRESTRICTED FLOW INSTRUCTION CARD

#### Station Two: Measuring Unrestricted Flow (0% restriction; 100% opening)

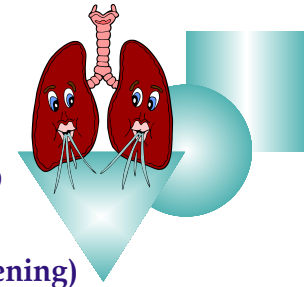
Supplies needed:

- 4 *Pom-pom shooters* (1 can be shared among group members)
- 4 Regular mouth pieces (0% restriction)
- 4 Nose clips
- 4 Goggles
- 4 Multicolored Pom-Poms small enough to fit through 1/2" PVC pipe
- 4 Metric Rulers
- 250 ml Beaker
- Paper towels
- *Station Instruction Card*
- 100 ml Alcohol

1. Each person should have a *pom-pom shooter*. If sharing, make sure to use your mouthpiece or clean mouthpiece with alcohol before other students use the *pom-pom shooter*.
2. If changing mouth pieces, *do not push the mouth piece on tightly*. It will get stuck!
3. Wear goggles to protect the eyes.
4. Practice shooting a *pom-pom* out of the *pom-pom shooter*. This is not as easy as it looks and you need to *avoid* inhaling. If you inhale, the *pom-pom* might fly back into your mouth. (Cloth screen material can be added to the mouthpiece to prevent this problem.)
5. Begin to shoot and measure the distance where each *pom-pom* lands. Follow these steps:
  - Members of the group should position themselves along the walkway to assist in measuring and recording the distance for the person using the *pom-pom shooter*.
  - The group member shooting *the pom-pom shooter* will put a nose clip on his or her nose. Use this clip through all the stations and turn it in to the teacher at the end of the lab.
  - Load a *pom-pom* and stand at the starting line; prepare the *pom-pom*. Inhale as deeply as possible, place your mouth over the mouthpiece, then quickly exhale into the *pom-pom shooter* in one large "puff" to shoot the pom-pom.
  - Measure the distance from the start line to the landing point of the *pom-pom* after each shot.
  - Record the measurement in **Data Table 1**.
6. Repeat step 5 two more times for a total of three measurements.
7. Add these measurements up and divide by three for an *average*. Post average in the **Data Table 1**. Your averages will be posted on the **Class Data Table** after you complete all five stations.

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## Pulmo-Park Pom-Pom Shooter: Measuring the Effect of Restricted Breathing on Peak Expiratory Flow (PEF)



### STATION THREE: MEASURING RESTRICTED FLOW (25%) INSTRUCTION CARD

#### Station Three: Measuring Unrestricted Flow (25% restriction; 75% opening)

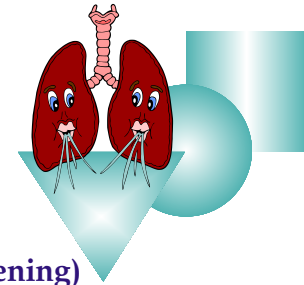
Supplies needed:

- 4 *Pom-pom shooters* (1 can be shared among group members)
- 4 Nose clips
- 4 Multicolored Pom-Poms small enough to fit through 1/2" PVC pipe for each student in the group
- *Station Instruction Card*
- 100 ml Alcohol
- 4 mouth pieces (25% restriction)
- 4 Goggles
- 4 Metric Rulers
- 250 ml Beaker
- Paper towels

1. Each person should have a *pom-pom shooter*. If sharing, make sure to use your mouthpiece or clean mouthpiece with alcohol before other students use the *pom-pom shooter*.
2. If changing mouth pieces, *do not push the mouth piece on tightly*. It will get stuck!
3. Wear goggles to protect the eyes.
4. Practice shooting a *pom-pom* out of the *pom-pom shooter*. This is not as easy as it looks and you need to *avoid* inhaling. If you inhale, the *pom-pom* might fly back into your mouth. (Cloth screen material can be added to the mouthpiece to prevent this problem.)
5. Begin to shoot and measure the distance where each *pom-pom* lands. Follow these steps:
  - Members of the group should position themselves along the walkway to assist in measuring and recording the distance for the person using the *pom-pom shooter*.
  - The group member shooting *the pom-pom shooter* will put a nose clip on his or her nose. Use this clip through all the stations and turn it in to the teacher at the end of the lab.
  - Load a *pom-pom* and stand at the starting line; prepare the *pom-pom*. Inhale as deeply as possible, place your mouth over the mouthpiece, then quickly exhale into the *pom-pom shooter* in one large "puff" to shoot the pom-pom.
  - Measure the distance from the start line to the landing point of the *pom-pom* after each shot.
  - Record the measurement in **Data Table 1**.
6. Repeat step 5 two more times for a total of three measurements.
7. Add these measurements up and divide by three for an *average*. Post average in the **Data Table 1**. Your averages will be posted on the **Class Data Table** after you complete all five stations.

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## Pulmo-Park Pom-Pom Shooter: Measuring the Effect of Restricted Breathing on Peak Expiratory Flow (PEF)



### STATION FOUR: MEASURING RESTRICTED FLOW (50%) INSTRUCTION CARD

#### Station Four: Measuring Unrestricted Flow (50% restriction; 50% opening)

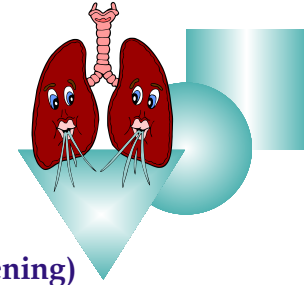
Supplies needed:

- 4 *Pom-pom shooters* (1 can be shared among group members)
- 4 Nose clips
- 4 Multicolored Pom-Poms small enough to fit through 1/2" PVC pipe for each student in the group
- *Station Instruction Card*
- 100 ml Alcohol
- 4 mouth pieces (50% restriction)
- 4 Goggles
- 4 Metric Rulers
- 250 ml Beaker
- Paper towels

1. Each person should have a *pom-pom shooter*. If sharing, make sure to use your mouthpiece or clean mouthpiece with alcohol before other students use the *pom-pom shooter*.
2. If changing mouth pieces, *do not push the mouth piece on tightly*. It will get stuck!
3. Wear goggles to protect the eyes.
4. Practice shooting a *pom-pom* out of the *pom-pom shooter*. This is not as easy as it looks and you need to *avoid* inhaling. If you inhale, the *pom-pom* might fly back into your mouth. (Cloth screen material can be added to the mouthpiece to prevent this problem.)
5. Begin to shoot and measure the distance where each *pom-pom* lands. Follow these steps:
  - Members of the group should position themselves along the walkway to assist in measuring and recording the distance for the person using the *pom-pom shooter*.
  - The group member shooting *the pom-pom shooter* will put a nose clip on his or her nose. Use this clip through all the stations and turn it in to the teacher at the end of the lab.
  - Load a *pom-pom* and stand at the starting line; prepare the *pom-pom*. Inhale as deeply as possible, place your mouth over the mouthpiece, then quickly exhale into the *pom-pom shooter* in one large "puff" to shoot the pom-pom.
  - Measure the distance from the start line to the landing point of the *pom-pom* after each shot.
  - Record the measurement in **Data Table 1**.
6. Repeat step 5 two more times for a total of three measurements.
7. Add these measurements up and divide by three for an *average*. Post average in the **Data Table 1**. Your averages will be posted on the **Class Data Table** after you complete all five stations.

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## Pulmo-Park Pom-Pom Shooter: Measuring the Effect of Restricted Breathing on Peak Expiratory Flow (PEF)



### STATION FIVE: MEASURING RESTRICTED FLOW (75%) INSTRUCTION CARD

#### Station Five: Measuring Unrestricted Flow (75% restriction; 25% opening)

Supplies needed:

- 4 *Pom-pom shooters* (1 can be shared among group members)
- 4 Nose clips
- 4 Multicolored Pom-Poms small enough to fit through 1/2" PVC pipe for each student in the group
- *Station Instruction Card*
- 100 ml Alcohol
- 4 mouth pieces (50% restriction)
- 4 Goggles
- 4 Metric Rulers
- 250 ml Beaker
- Paper towels

1. Each person should have a *pom-pom shooter*. If sharing, make sure to use your mouthpiece or clean mouthpiece with alcohol before other students use the *pom-pom shooter*.
2. If changing mouth pieces, *do not push the mouth piece on tightly*. It will get stuck!
3. Wear goggles to protect the eyes.
4. Practice shooting a *pom-pom* out of the *pom-pom shooter*. This is not as easy as it looks and you need to *avoid* inhaling. If you inhale, the *pom-pom* might fly back into your mouth. (Cloth screen material can be added to the mouthpiece to prevent this problem.)
5. Begin to shoot and measure the distance where each *pom-pom* lands. Follow these steps:
  - Members of the group should position themselves along the walkway to assist in measuring and recording the distance for the person using the *pom-pom shooter*.
  - The group member shooting *the pom-pom shooter* will put a nose clip on his or her nose. Use this clip through all the stations and turn it in to the teacher at the end of the lab.
  - Load a *pom-pom* and stand at the starting line; prepare the *pom-pom*. Inhale as deeply as possible, place your mouth over the mouthpiece, then quickly exhale into the *pom-pom shooter* in one large "puff" to shoot the pom-pom.
  - Measure the distance from the start line to the landing point of the *pom-pom* after each shot.
  - Record the measurement in **Data Table 1**.
6. Repeat step 5 two more times for a total of three measurements.
7. Add these measurements up and divide by three for an *average*. Post average in the **Data Table 1**. Your averages will be posted on the **Class Data Table** after you complete all five stations.

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