



### Perceived Exertion (RPE), Comfort, and Control Assessment

As you become more familiar with your body's reactions during exercise, you'll learn to recognize when it's time to change how hard you work. For instance, consider a walker aiming for **moderate-intensity exercise**. Their target would be to hit a **"somewhat hard"** level, corresponding to **12-14 on the Borg Scale**. Should they find their effort registering as **"very light"** (a **9 on the Borg Scale**), this is an indicator to ramp up your pace. Conversely, if the walker experiences his or her effort as **"extremely hard"** (ranking at **19 on the Borg Scale**), it's a sign to reduce the intensity, slowing down to stay within the moderate-intensity zone.

#### Rating of Perceived Exertion

- 6 - No exertion, sitting and resting
- 7 - Very, very light
- 8 - Very, very light
- 9 - Very light
- 10 - Very light
- 11 - Fairly light
- 12 - Somewhat hard
- 13 - Somewhat hard
- 14 - Somewhat hard
- 15 - Hard
- 16 - Very hard
- 17 - Very hard
- 18 - Very, very hard
- 19 - Extremely hard
- 20 - Maximum exertion (Borg, 1998)

### 1. Scoop Shovel

#### Worksheet 1: Comfort and Cardiovascular Effort Assessment for Shovel **without** Auxiliary Attachment Use

Participant Information: Emily Popa

Participant ID:

Shovel Types (A, B, C, D, E, F, G, H, I, J, K, L, M, N.....):

Task Description: Scoop up wood pellets and transfer them to a wheelbarrow.

#### Comfort Evaluation for Scoop Shovel:

1. On a scale from 1 to 5, rate the overall comfort of using the shovel (**1 being extremely comfortable, 2 comfortable, 3 moderately comfortable, 4 uncomfortable, 5 being extremely uncomfortable**).

(Rating Shovel 1 2 Shovel 2 4 Shovel 3 4).



- Describe any specific discomfort points while using shovels. (e.g. hands, wrists, arms, or body) Please describe.

Shovel 1 lower back  
 Shovel 2 back  
 Shovel 3 mid back

- Identify features of the shovel that contributed to or alleviated discomfort. (e.g., grip design, curvature)

Shovel 1 weight distribution helped  
 Shovel 2 front heavy, weird shape for scoop  
 Shovel 3 very front heavy

- Suggest improvements for the shovel's comfort.

Shovel 1 none  
 Shovel 2 different shape for scoop part  
 13/1/11 Shovel 3 taller, not as front heavy

**Worksheet 2: Control and Perceived Exertion Assessment for Shovel without Auxiliary Attachment Use**

**Control Evaluation:**

- On a scale from 1 to 5, rate your perceived level of control while using the shovel (**1 being extremely in control, 2 in control, 3 moderately in control, 4 slightly in control, 5 Not in control at all**).

(Rating Shovel 1 2 Shovel 2 3 Shovel 3 3).

- Discuss the shovel's ability to maintain control over the load.

Shovel 1 good (easy to rotate and move)  
 Shovel 2 a little hard to pick up  
 Shovel 3 had to use whole body to move at times

- Identify any design aspects of the shovel that hindered control.

Shovel 1 a little front heavy but not bad  
 Shovel 2 pail shape scoop shape  
 Shovel 3 front heavy, too short

- Recommend enhancements for better control.



Shovel 1 more weight above (wouldn't have to bend over)  
 Shovel 2 flatter @ scooper, lighter  
 Shovel 3 longer, not as front heavy

**Cardiovascular Effort Evaluation *without* Auxiliary Attachment:**

5. Estimate your heart rate during the task and compare it to your target heart rate zone.

Using the Borg RPE scale (6-20), rate your perceived exertion.

(Rating Rating Shovel 1 130 Shovel 2 120 Shovel 3 140).

Savorite = #1





**Comfort Evaluation for Scoop Shovel with auxiliary attachment:**

- 1 On a scale from 1 to 5, rate the overall comfort of using the shovel (1 being extremely comfortable, 2 comfortable, 3 moderately comfortable, 4 uncomfortable, 5 being extremely uncomfortable).

(Rating Shovel 1 4 Shovel 2 3 Shovel 3 2 ).

- 2 Describe any specific discomfort points while using shovels. (e.g. hands, wrists, arms, or body) Please describe.

Shovel 1 back, sore arm

Shovel 2 back

Shovel 3 back

- 3 Identify features of the shovel that contributed to or alleviated discomfort. (e.g., grip design, curvature)

Shovel 1 grip and front weight, attachment sucked

Shovel 2 length

Shovel 3 length made back hurt, weight was much more even

did not help w/ weight

- 4 Suggest improvements for the shovel's comfort.

Shovel 1 different attachment

Shovel 2 little longer, notes front heavy

Shovel 3 a little longer

**Worksheet 2: Control and Perceived Exertion Assessment for Shovel with auxiliary attachment Use**

**Control Evaluation:**

- 5 On a scale from 1 to 5, rate your perceived level of control while using the shovel (1 being extremely in control, 2 in control, 3 moderately in control, 4 slightly in control, 5 Not in control at all).

(Rating Shovel 1 4 Shovel 2 2 Shovel 3 1 ).

- 6 Discuss the shovel's ability to maintain control over the load.

Shovel 1 fell a lot (I was struggling)



- Shovel 2 good, handle helped with weight
- Shovel 3 good, handle helped with weight
- 7 Identify any design aspects of the shovel that hindered control.
- Shovel 1 attachment
- Shovel 2 it was fine
- Shovel 3 length (too short)
- 8 Recommend enhancements for better control.
- Shovel 1 different attachment
- Shovel 2 not as front heavy
- Shovel 3 best one, handle helped w/ weight

**Cardiovascular Effort Evaluation with auxiliary attachment:**

5. Estimate your heart rate during the task and compare it to your target heart rate zone.

Using the Borg RPE scale (6-20), rate your perceived exertion.

(Rating Rating Shovel 1 130 Shovel 2 130 Shovel 3 120 ).

Savorite = #3



## 2. Pitchfork

### Worksheet 1: Comfort and Cardiovascular Effort Assessment for Pitchfork **without** Auxiliary Attachment Use

Pitchfork Type (A, B, C, D, E, F, G, H, I, J, K, L, M.....):

Task Description: Removing straw mixed with dung and transferring them to a wheelbarrow.

#### Comfort Evaluation for Pitchfork:

put on mat

- 1 On a scale from 1 to 5, rate the overall comfort of using the pitchfork (**1 being extremely comfortable, 2 comfortable, 3 moderately comfortable, 4 uncomfortable, 5 being extremely uncomfortable**).

(Rating Pitchfork 1 2 Pitchfork 2 4 Pitchfork 3 5).

- 2 Describe any specific discomfort points while using shovels. ( e.g. hands, wrists, arms, or body) Please describe.

Pitchfork 1 right Sorearm

Pitchfork 2 mid & lower back, wrist (right)

Pitchfork 3 lowerback

- 3 Identify features of the shovel that contributed to or alleviated discomfort. (e.g., grip design, curvature)

Pitchfork 1 heaviness in front

Pitchfork 2 more movement needed because so Slimbisy

Pitchfork 3 heavy, short, took a lot more labor due to  
bristles being too far apart

- 4 Suggest improvements for the shovel's comfort.

Pitchfork 1 re-distribute weight

Pitchfork 2 heavier

Pitchfork 3 lighter, closer bristles, taller

~~Overall 0-4~~



**Worksheet 2: Control and Perceived Exertion Assessment for Pitchfork without Auxiliary Attachment Use**

**Control Evaluation:**

1 On a scale from 1 to 5, rate your perceived level of control while using the (1 being extremely in control, 2 in control, 3 moderately in control, 4 slightly in control, 5 Not in control at all).

(Rating Pitchfork 1 3 Pitchfork 2 4 Pitchfork 3 3).

2 Discuss the shovel's ability to maintain control over the load.

Pitchfork 1 ~~all fell through a lot~~ fell through a lot

Pitchfork 2 very light, harder to scoop

Pitchfork 3 all fell through a lot

3 Identify any design aspects of the shovel that hindered control.

Pitchfork 1 needing to rotate more with weight

Pitchfork 2 too light

Pitchfork 3 hand spread & weight

4 Recommend enhancements for better control.

Pitchfork 1 ~~more flexible attachment~~ lighter, shorter

Pitchfork 2 heavier

Pitchfork 3 longer, lighter

**Cardiovascular Effort Evaluation without Auxiliary Attachment:**

5. Estimate your heart rate during the task and compare it to your target heart rate zone.

Using the Borg RPE scale (6-20), rate your perceived exertion for pitchforks.

(Rating Pitchfork 1 100 Pitchfork 2 120 Pitchfork 3 130).

Favorite = #2



**Worksheet 1: Comfort and Cardiovascular Effort Assessment for Pitchfork with auxiliary attachment Use**

**Comfort Evaluation for Pitchfork with auxiliary attachment:**

1 On a scale from 1 to 5, rate the overall comfort of using the pitchfork (1 being extremely comfortable, 2 comfortable, 3 moderately comfortable, 4 uncomfortable, 5 being extremely uncomfortable).

1. (Rating Pitchfork 1 3 Pitchfork 2 2 Pitchfork 3 3).

↳ but not effective

3 Describe any specific discomfort points while using shovels. (e.g. hands, wrists, arms, or body) Please describe.

Pitchfork 1 Sore arms (both), back

127/82

Pitchfork 2 none - but moved very slowly due to tool

Pitchfork 3 lower back

4 Identify features of the shovel that contributed to or alleviated discomfort. (e.g., grip design, curvature)

Pitchfork 1 twisting motion

Pitchfork 2 not able to twist or scrap effectively

Pitchfork 3 grip helped, more even weight

5 Suggest improvements for the shovel's comfort.

Pitchfork 1 more flexible attachment

Pitchfork 2 no heavier, flexibility for attachment

Pitchfork 3 little lighter



**Worksheet 2: Control and Perceived Exertion Assessment for Pitchfork with auxiliary attachment Use**

**Control Evaluation:**

1 On a scale from 1 to 5, rate your perceived level of control while using the (1 being extremely in control, 2 in control, 3 moderately in control, 4 slightly in control, 5 Not in control at all).

2 (Rating Pitchfork 1 3 Pitchfork 2 4 Pitchfork 3 2).

3 Discuss the shovel's ability to maintain control over the load.

Pitchfork 1 all fell through

Pitchfork 2 hard to scrap

Pitchfork 3 hard to get poop, easier to dump

4 Identify any design aspects of the shovel that hindered control.

Pitchfork 1 uneven weight

Pitchfork 2 position of attachment

Pitchfork 3 ~~the bottom~~ bars too spaced out

5 Recommend enhancements for better control.

Pitchfork 1 lighter

Pitchfork 2 moveable (in motion) of attachment

Pitchfork 3 lighter

**Cardiovascular Effort Evaluation with Auxiliary Attachment:**

6. Estimate your heart rate during the task and compare it to your target heart rate zone.

Using the Borg RPE scale (6-20), rate your perceived exertion for pitchforks.

(Rating Pitchfork 1 110 Pitchfork 2 120 Pitchfork 3 130).

Savorite = #3