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### 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: Makenna Parks

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 3 Shovel 2 2 Shovel 3 2).

↓  
Favorite!

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

Shovel 1 Right arm sore<sup>at</sup> almost end.

Shovel 2 None

Shovel 3 Back (lower) towards end

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

Shovel 1 Length of handle (longer than I'm used to)

Shovel 2 N/A

Shovel 3 N/A

4. Suggest improvements for the shovel's comfort.

Shovel 1 Slightly shorter handle

Shovel 2 N/A

Shovel 3 N/A

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

**Control Evaluation:**

1 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 2).

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

Shovel 1 Really good

Shovel 2 Little wobbly

Shovel 3 Really good

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

Shovel 1 Longer handle maybe (I didn't have any issue)

Shovel 2 ~~None~~ Large shovel head

Shovel 3 N/A

4 Recommend enhancements for better control.



Shovel 1 None really  
Shovel 2 More angle to shovel head  
Shovel 3 None

**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 13 Shovel 2 13 Shovel 3 11).

**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 3 Shovel 2 3 Shovel 3 2).

↓  
Favorite

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

Shovel 1 Right arm halfway through

Shovel 2 Right shoulder

Shovel 3 Right shoulder

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

Shovel 1 Angle(?) of auxillary arm (arm helped back, sore arm)

Shovel 2 N/A

Shovel 3 Auxillary arm alleviated

- 4 Suggest improvements for the shovel's comfort.

Shovel 1 Lower angle of auxillary arm

Shovel 2 N/A

Shovel 3 N/A

**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 3 Shovel 2 3 Shovel 3 2).

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

Shovel 1 Decent; auxillary arm took some<sup>time</sup> getting used to it



Shovel 2 Good

Shovel 3 Good

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

Shovel 1 None

Shovel 2 None

Shovel 3 None

8 Recommend enhancements for better control.

Shovel 1 ~~longer~~ None

Shovel 2 longer to shovel handle

Shovel 3 None

**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 11 Shovel 2 13 Shovel 3 11).



## 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:

- 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 1 Pitchfork 2 3 Pitchfork 3 4).

↓  
Favorite!

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

Pitchfork 1 None

Pitchfork 2 ~~Discomfortable~~ Back

Pitchfork 3 Elbow, <sup>R</sup>Shoulder, <sup>R</sup>Wrist

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

Pitchfork 1 Length of handle definitely helped

Pitchfork 2 Flimsy material, short handle

Pitchfork 3 Short handle, no angle to lower portion, + heavy material

- 4 Suggest improvements for the shovel's comfort.

Pitchfork 1 None

Pitchfork 2 Higher quality material

Pitchfork 3 Angle to prongs, longer handle

① steel  
or plastic blunt  
3 metal.



**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 2 Pitchfork 2 4 Pitchfork 3 4).

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

Pitchfork 1 Good

Pitchfork 2 not too good Average, very all over the place

Pitchfork 3 Decent, little material was moved sometimes

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

Pitchfork 1 None

Pitchfork 2 Flimsy material, short handle

Pitchfork 3 Large distance between tines/prongs

- 4 Recommend enhancements for better control.

Pitchfork 1 None

Pitchfork 2 Higher quality material, longer handle

Pitchfork 3 Smaller distance between prongs

**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 9 Pitchfork 2 10 Pitchfork 3 11).



**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 1 Pitchfork 3 3).

Pitchfork 2 is circled in blue with an arrow pointing down to the word "favorite!!" written in blue.

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

Pitchfork 1 Back, shoulders 11/9/81 75

Pitchfork 2 None

Pitchfork 3 Shoulder, both arms, back

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

Pitchfork 1 Length of handle + auxillary arm together 11/3/73

Pitchfork 2 Auxillary arm helped a tone 81

Pitchfork 3 ~~Angle~~ Angle of pitchfork head contributed

5 Suggest improvements for the shovel's comfort.

Pitchfork 1 Shorter handle w/ auxillary arm

Pitchfork 2 None, my favorite so far!

Pitchfork 3 Angle head more + arm will help more!



**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 2 Pitchfork 3 3).

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

Pitchfork 1 A little wobbly

Pitchfork 2 Good, hard to flip fork over

Pitchfork 3 Couldn't gauge angle to floor well

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

Pitchfork 1 Position of <sup>auxiliary</sup> arm compared to how I hold it naturally

Pitchfork 2 Stable auxiliary arm (no flexibility)

Pitchfork 3 Angle of pitchfork head

5 Recommend enhancements for better control.

Pitchfork 1 None

Pitchfork 2 None

Pitchfork 3 Change pitchfork angle head

**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 12 Pitchfork 2 9 Pitchfork 3 14).