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18/April



### 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:

Shovel #1 was my favorite

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 3).



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

Shovel 1 none

Shovel 2 R forearm

Shovel 3 none

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

Shovel 1 the handle was a little to long + straight up + down

Shovel 2 height of shovel

Shovel 3 height of shovel, but better angle than #2

4. Suggest improvements for the shovel's comfort.

Shovel 1 more of a curved handle

Shovel 2 make it taller

Shovel 3 make it taller

**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 I had control over where I was putting it.

Shovel 2 I mostly had control

Shovel 3 I had more control than #2

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

Shovel 1 straight up + down handle

Shovel 2 height of shovel

Shovel 3 height of shovel

4 Recommend enhancements for better control.



Shovel 1 more curved handle  
Shovel 2 make taller ; curve angle more  
Shovel 3 make taller

**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 6 Shovel 2 8 Shovel 3 7 ).

shovel #2 was my favorite

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 1 Shovel 3 2).

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

Shovel 1 left wrist

Shovel 2 n/a

Shovel 3 left forearm

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

Shovel 1 the extra handle made it harder to twist + dump

Shovel 2 the extra handle gave me a lot more leverage

Shovel 3 the plastic material and minimal curvature

- 4 Suggest improvements for the shovel's comfort.

Shovel 1 maybe make handle shorter

Shovel 2 n/a

Shovel 3 make shovel more curved

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 2 Shovel 2 1 Shovel 3 2).

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

Shovel 1 I had control until I dumped the load



Shovel 2 I had complete control  
 Shovel 3 harder to lift load

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

Shovel 1 long axillary handle

Shovel 2 none

Shovel 3 plastic material & minimal curvature

8 Recommend enhancements for better control.

Shovel 1 shorter axillary handle

Shovel 2 none

Shovel 3 make shovel curved more; stronger material

**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 10 Shovel 2 7 Shovel 3 9).



pitchfork #3  
was my favorite

## 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 3).

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

Pitchfork 1 none

Pitchfork 2 left forearm was sore

Pitchfork 3 none

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

Pitchfork 1 the curvature was ideal

Pitchfork 2 straight design

Pitchfork 3 the curvature was ideal + it was light weight

- 4 Suggest improvements for the shovel's comfort.

Pitchfork 1 none

Pitchfork 2 make it more curved

Pitchfork 3 none



**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 1 Pitchfork 2 3 Pitchfork 3 1).

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

Pitchfork 1 I had control the entire time.

Pitchfork 2 it was harder to get a good scoop

Pitchfork 3 I had control the entire time

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

Pitchfork 1 none

Pitchfork 2 straight design

Pitchfork 3 none

- 4 Recommend enhancements for better control.

Pitchfork 1 none

Pitchfork 2 make it more curved

Pitchfork 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 for pitchforks.

(Rating Pitchfork 1 7 Pitchfork 2 9 Pitchfork 3 6).

**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 4 Pitchfork 2 2 Pitchfork 3 3).

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

Pitchfork 1 right shoulder  
it was hard to twist + dump the load

Pitchfork 2 left shoulder (still hard to dump)

Pitchfork 3 left shoulder

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

Pitchfork 1 tall handle

Pitchfork 2 handle doesn't allow for natural hand placement

Pitchfork 3 long handle

5 Suggest improvements for the shovel's comfort.

Pitchfork 1 maybe shorter handle

Pitchfork 2 different handle angle?

Pitchfork 3 shorter handle





**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 1).

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

Pitchfork 1 I lost control when dumping

Pitchfork 2 still lost some control when dumping

Pitchfork 3 I had control

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

Pitchfork 1 tall handle

Pitchfork 2 handle angle

Pitchfork 3 none

5 Recommend enhancements for better control.

Pitchfork 1 shorter handle

Pitchfork 2 different angle (+/- moveable)

Pitchfork 3 none

**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 10 Pitchfork 2 8 Pitchfork 3 7).