



Perceived Exertion (RPE), Comfort, and Control Assessment – Person A’s form

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:

Participant ID: A

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(all yellow) = 3. Shovel 2 (wood handle) =2 Shovel 3 (short metal) =4



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

Shovel 1 – back/side. it was long for me so my elbow had to reach back far to lift up

Shovel 2- back/side - the scoop was large so it got heavy

Shovel 3 – wrist, back/side – it was short so I had to bend a lot

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

Shovel 1 – the curved handle at the top and small scoop was good, it was lighter weight

Shovel 2 – the height of this one was perfect for me

Shovel 3 – this one was too short and the metal handle grip wasn't good so it was hard to use

4. Suggest improvements for the shovel's comfort.

Shovel 1 – shorter in height

Shovel 2 – smaller scoop so it doesn't get as heavy

Shovel 3 – taller in height

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 2 Shovel 3 3

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

Shovel 1 –easy to maintain control over the load

Shovel 2 – easy to control, could get wobbly when the scoop was full and too heavy

Shovel 3 – light weight, so easy to control

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

Shovel 1 – the plastic shovel was harder to scoop with than the sharper metal

Shovel 2 – the large scoop would get wobbly

Shovel 3 – it is short so it was harder to bend down for control

- 4 Recommend enhancements for better control.



Shovel 1 – shorter in length/height, maybe not plastic as it is slippery and harder to scoop with

Shovel 2 - smaller scoop size

Shovel 3 – taller in height/length

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 Shovel 1= 13

Shovel 2= 12

Shovel 3 = 15

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 (yellow) = 2

Shovel 2= 2

Shovel 3 (short metal) =3.



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

Shovel 1- mild discomfort in my side/back, got better with use of the handle

Shovel 2 - mild discomfort in my side/back, got better with use of the handle

Shovel 3 – mild discomfort in side/back, but did not have to bend as much

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

Shovel 1 – the ergonomic handle

Shovel 2 – the ergonomic handle made it easier to pick up the heavy load the scoop carries

Shovel 3 - the ergonomic handle

- 4 Suggest improvements for the shovel's comfort.

Shovel 1- shorter

Shovel 2 – no improvements

Shovel 3 – taller/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 = 2 Shovel 2= 1 Shovel 3= 2

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

Shovel 1 – good control especially with the handle added on so it doesn't slip out of my hand

Shovel 2 – great control since this shovel fit my height the best, less wobbly with the handle

Shovel 3 – better control than without the handle

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

Shovel 1 - none

Shovel 2 – the large scoop can still be heavy/wobbly when too full but better control w/ handle

Shovel 3 – the metal handle is not very comfortable/ doesn't fit my hand well

- 7 Recommend enhancements for better control.

Shovel 1 – none, aside from a shorter shovel for me personally

Shovel 2 - none



Shovel 3 – longer/taller shovel so I don't have to bend as much

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 = 12 Shovel 2= 10 Shovel 3 = 13

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 (yellow) =2 Pitchfork 2 (purple)= 1 Pitchfork 3 (orange) =4

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

Pitchfork 1- minimal to no discomfort

Pitchfork 2 – no discomfort



Pitchfork 3 – very long/tall for me, and heavy so it hurt my wrists and back

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

Pitchfork 1 – it was fairly light weight so did not cause discomfort

Pitchfork 2 – the lightweight design and grip were great and caused no discomfort

Pitchfork 3 – it was tall/long and the plastic was slippery to hold on to, had to bend my elbow back far to move it.

- 4 Suggest improvements for the shovel's comfort.

Pitchfork 1 – shorter/adjustable length/height since it was a bit tall for me

Pitchfork 2 - none

Pitchfork 3 – shorter pitchfork, non-slip plastic, lighter weight

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(yellow) = 2 Pitchfork 2(purple) =1 Pitchfork 3 (orange) =4

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

Pitchfork 1 – good control

Pitchfork 2 – great control

Pitchfork 3 - little to no control since it was long, heavy, and slippery

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

Pitchfork 1 - none



Pitchfork 2 - none

Pitchfork 3 – length (too long), weight (too heavy), and hard to hold on to

- 4 Recommend enhancements for better control.

Pitchfork 1- none

Pitchfork 2 -none

Pitchfork 3 – shorter, lighter weight

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= 10 Pitchfork 2= 8 Pitchfork 3 = 18.

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 (yellow) =2 Pitchfork 2 (purple)= 1 Pitchfork 3 (orange)= 4

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

Pitchfork 1 - none

Pitchfork 2 -none

Pitchfork 3- arm/wrist – since it is too long and I had to reach far back, and it is heavy

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

Pitchfork 1 – grip was good, auxiliary handle helped

Pitchfork 2 - grip, auxiliary handle



Pitchfork 3 – the handle did not help with discomfort since it slid around on the plastic too much to get good grip and control

- 5 Suggest improvements for the shovel's comfort.

Pitchfork 1- maybe shorter in length, was a bit tall

Pitchfork 2- none

Pitchfork 3 – shorter, lighter weight

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=1 Pitchfork 2 =1 Pitchfork 3 (orange) =5

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

Pitchfork 1 – great control and easier to handle with auxiliary piece

Pitchfork 2 – great control

Pitchfork 3 – the auxiliary handle slid around on the orange plastic pitchfork, very hard to maneuver the sand and manure

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

Pitchfork 1- none

Pitchfork 2 -none

Pitchfork 3 – the auxiliary handle sliding around on the plastic coating of the pitchfork

- 5 Recommend enhancements for better control.

Pitchfork 1- none



Pitchfork 2 - none

Pitchfork 3 – lighter weight and different material (not the slippery plastic)

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= 8

Pitchfork 2 =7

Pitchfork 3= 17