

## Worksheet 'The Great Sperm Race' – Unit 3 Reproduction

*In this game, you are one of the 250.000.000 sperm cells that has to pass a lot of obstacles to survive and to finally reach the egg cell. Only one sperm cell can fertilise the egg cell (and after that there is still a lot of uncertainty whether everything will go right). Can you survive and reach the egg cell in time?*

Play all levels and answer the questions about each level. Write down your answers in your notebook. Every first page of a level gives you information.

### Level 1: the vagina

Number of sperm cells: 250.000.000

1. Keep your distance from the wall, because the wall is acidic, and you will not survive when you stick to the wall. Explain the function of this acidic environment of the vagina.
2. How does a sperm cell reach the opening of the cervix?

### Level 2: the cervix

Number of sperm cells: \_\_\_\_\_

3. 'Leukocytes eat sperm!' What is the function of these leukocytes?
4. Why is it logical that leukocytes need to have this function?

*In this level you can shut down the leukocytes (white blood cells). Of course, this is not possible in a real human body, but it is a nice addition to the game. Leukocytes will always do their job.*

### Level 3: the uterus

Number of sperm cells: \_\_\_\_\_

5. The uterus wall is made of a layer of muscles. Explain why the uterus needs these muscles.  
*The tip for this level is that you can use the contractions of the muscles.*
6. You can choose two ways out of this level. What are these exits?
7. Only one will contain the egg cell. Explain why.
8. Before you can exit this level, you have to do something in the top middle. What is this that you need to do?
9. What is an X and what is an y?
10. When will the child be a girl or a boy?

*Determining the sex of child is based on the chromosomes. This is not done by the sperm cell, as you can do this in the game, but by the chromosome carried by the sperm cell. It contains an X-chromosome or a y-chromosome.*

*Also, the fallopian tube does not have to open. The cervix is closed most of the menstrual period and opens during the fertile period.*

### Level 4: the fallopian tubes

Number of sperm cells: \_\_\_\_\_

*You can gather 'nutrients'. This gives you more time, which actually must be more energy to stay alive.*

11. Why does a sperm cell need energy? How can a sperm cell make energy?  
*Capacitation is a change of the 'head' of the sperm cell in order to release enzymes which will break down the outer layer of the egg cell.*
12. How can enzymes help the sperm cell?
13. What is the name of the process by which the egg cell ends up in the fallopian tube?
14. When does this process take place during the menstrual cycle?
15. When during the menstrual cycle can the fertilization take place?  
*You (as a sperm cell) probably were already at the end of the fallopian tube before the egg cell was released. It is also possible to arrive after the egg cell is released.*
16. Explain that the fertile period (the period in which sex can lead to a pregnancy) is longer than the period in which fertilization can take place.
17. How long is the fertile period, why is it this long and when is this period during the menstrual cycle?