

# Puberty and Reproduction

## A Roads to Family Modification of a Lesson Plan from Rights, Respect, Responsibility

Roads to Family has modified the original 3R lesson to include insemination and in vitro fertilization (IVF).

<p><b>NSES ALIGNMENT:</b> By the end of 5th grade, students will be able to:</p> <p>PD.5.CC.2 – Describe how puberty prepares human bodies for the potential to reproduce and that some healthy people have conditions that impact the ability to reproduce.</p> <p>AP.5.CC.1 - Recall the human reproductive systems, including the external and internal body parts and their functions, and that there are natural variations in human bodies.</p> <p>SH.5.CC.1 - Explain the relationship between sexual intercourse and human reproduction.</p> <p>SH.5.CC.2 - Explain the range of ways pregnancy can occur (e.g., IVF, surrogacy).</p> <p><b>OREGON STANDARDS ALIGNMENT:</b></p> <p>HE.1.5.6 - Discuss human reproductive systems including reproductive anatomy and function.</p> <p>HE.1.3.9 - Recognize how puberty prepares human bodies for the potential to reproduce.</p> <p>HE.1.6.25, HE 1.7.26, HE 1.8.26 - Explain sexual intercourse and the relationship to human reproduction.</p> <p>Note to educator: Oregon covers some of the concepts in this lesson in different grades than as specified in the National standards. We have included the OR standards that are the best match to the National Standards. In addition, OR standards do not include the range of ways pregnancy can occur, which</p>	<p><b>ADVANCE PREPARATION FOR LESSON:</b></p> <p>The slides for this lesson are labeled: 3Rs-Grade7-Lesson3-Reproduction-Basics.pptx You can download them here: <a href="https://roadstofamily.com/classroom-materials">https://roadstofamily.com/classroom-materials</a> Please note. There are a variety of illustrations in the slideck, and educators should feel free to choose the ones that work best for their class.</p> <p>Students can work in small groups. Determine how many groups.</p> <p>The worksheets and answer keys are here: RTF_3Rs-Grade5-Lesson2-Puberty-Reproduction_Handout.pdf Please use them to:</p> <ul style="list-style-type: none"><li>● Print and cut out the “Steps to Human Reproduction Cards.” There are three sets: penis-in-vagina sexual intercourse (PIV sex), insemination, and in vitro fertilization (IVF). Make enough sets for each small group.</li><li>● Print out the “Human Reproduction Worksheet” for each means of fertilization. Each group should have three: PIV Sex, Insemination, IVF</li><li>● Print out one copy of the “Human Reproduction Answer Key.” This is the answer guide for the educator.</li></ul> <p>You should be familiar with the functioning of the reproductive system and human reproduction and be prepared to respond to questions. A review can be found at: <a href="http://www.sexualityandu.ca/sexual-health/all-about-puberty/sexual-reproduction">http://www.sexualityandu.ca/sexual-health/all-about-puberty/sexual-reproduction</a></p> <p>For a summary of other means of human reproduction, including donors, surrogates, insemination and IVF, please read the <i>RTF Educator Guide to Assisted Reproduction</i> and watch the following videos:</p> <ul style="list-style-type: none"><li>● The British Fertility Society: Fertility Technologies Shaping Modern Families, <a href="https://youtu.be/dOi08g3CLOc">https://youtu.be/dOi08g3CLOc</a></li><li>● Amaze.org, Pregnancy and Reproduction Explained, <a href="https://www.youtube.com/watch?v=OejdOS4lqeE">https://www.youtube.com/watch?v=OejdOS4lqeE</a></li><li>● Amaze.org, How do LGBTQ couples become parents <a href="https://youtu.be/qczJ7qSczcQ">https://youtu.be/qczJ7qSczcQ</a></li></ul> <p>For terminology regarding fetal development: <a href="https://www.merckmanuals.com/home/women-s-health-issues/normal-pregnancy/stages-of-development-of-the-fetus">https://www.merckmanuals.com/home/women-s-health-issues/normal-pregnancy/stages-of-development-of-the-fetus</a></p> <p>It is also important for you to be aware of your district and state policies in place that may dictate what you can and cannot share about human reproduction.</p> <p><b>LEARNING OBJECTIVES:</b> By the end of this lesson, students will be able to:</p>
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<p>are now part of the national standards (SH.5.CC.2), and thus included in this lesson.</p> <p><b>TARGET GRADE:</b> Grade 5 Lesson 2</p> <p><b>TIME:</b> 60 Minutes</p> <p><b>MATERIALS NEEDED:</b></p> <ul style="list-style-type: none"> <li>• PowerPoint: “Sexual and Reproductive Anatomy”</li> <li>• Worksheet: “Human Reproduction” – three per student</li> <li>• Steps to Human Reproduction Cards – three sets for each small group</li> <li>• “Human Reproduction Answer Key” – three versions for the teacher</li> <li>• Board/newsprint</li> <li>• Markers/chalk</li> <li>• LCD projector and screen</li> <li>• Desktop or laptop with PowerPoint on it</li> </ul>	<ol style="list-style-type: none"> <li>1. Describe how puberty prepares the human body for the potential to reproduce. [Knowledge]</li> <li>2. Describe the process of human reproduction by identifying the correct order of steps involved in conception. [Knowledge]</li> </ol> <p><b>A NOTE ABOUT LANGUAGE:</b></p> <p>Language continues to evolve! We recommend being as inclusive as possible.</p> <p>This lesson does not use the terms female and male anatomy, but instead refers to transportation or delivery systems and networks. In doing so, we focus more on the process of how pregnancy happens and less on the people creating the pregnancy. This works well if students have already had an introduction to sex (female, male and intersex) and gender identity. If needed, please see additional lessons from the Sex Ed Open Learning Collection and 3Rs on these topics.</p> <p>When this lesson does refer to assigned-female and assigned-male bodies, we use the words “many” or “most” (and not the words “all” or “every”) in order to provide useful/accurate information, and to leave room for all the variations of the human body and in identities.</p> <p>There are many definitions of the word sex, so we use the term penis-in-vagina sexual intercourse, or PIV sex for short, to be very clear about what sexual activities can lead to a pregnancy. Use the terminology that works for your classroom, but be sure to define the terms clearly for the students and then modify the teaching materials accordingly.</p> <p>Because there is much controversy over the word conception (federal and state laws differ, as do individual opinions), it’s best to describe the process of fertilization and pregnancy and reserve the word conception to describe the whole process, in general.</p>
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**PROCEDURE:**

*Note to the Teacher: We have written an example narrative in quotes. Please modify so that you use the language and concepts most appropriate for your community, and that which meets your district and state policies.*

**STEP 1:** Tell students that today you are going to discuss how puberty can prepare the human body for the potential to reproduce. Ask: “Who remembers what puberty is?”

*Note to the Teacher: Answers might include a normal part of growing up when our bodies change from being a child’s body to an adult body. Remind students that puberty typically begins anywhere from age 8 – 16. Puberty usually begins a little earlier for many assigned-female bodies than it does for many assigned-male bodies. Puberty continues all the way until a person reaches their full adult height, sometime in the later teens for many assigned-female bodies and up to the early twenties for many assigned-male bodies.*

Say, “One of the biggest differences between a person who has gone through puberty and somebody who has not is that most adult bodies are able to reproduce, or make a baby. That is an important change that happens during puberty. The main changes that happen during puberty are the result of hormones: testosterone and estrogen mainly. Hormones are the natural chemicals our bodies make.”

(3 minutes)

*Note to Teacher: We have provided a variety of slides, some labeled and some not, and with multiple views: front, side and prone. Please use the slides that work best for you.*

**STEP 2:** Start the PowerPoint. Choose the slide/slides with the sperm transportation network that works best for your class. Say “Who can remember the names of the body parts in the sperm transportation system?” Together with the students, name the parts on the diagram.

Next, select the slide/slides with the egg and baby delivery system that works best for you. Say, “Who can remember the names of the parts of the egg and baby transportation system?”

*Note to the Teacher: It will not matter if they have seen the term ‘sperm transport system’ or ‘egg delivery network’ before (or a variation on the system/network theme) — they will recognize that these illustrations show the reproductive systems, regardless of whether they were labeled male and female anatomy in the past.*

*You may want to provide a word bank on the board/newsprint to help students to remember the names of the body parts.*

We call our reproductive systems delivery or transportation systems, because they are a series of tubes and tunnels that are designed to get sperm and egg cells from where they are made to where they need to go, to create a pregnancy.

(9 minutes)

**STEP 3:** Tell students: “Puberty begins because a person’s body starts to produce a very large quantity of hormones that they were only producing in small amounts before. People with a sperm transport system start to produce a lot more testosterone and a little bit of estrogen and people with an egg and baby delivery network start to produce a lot more estrogen and a little bit of testosterone. All of these changes happen because of a surge of these hormones.”

**STEP 4:** Tell students: “Through the production of testosterone and estrogen, the reproductive system becomes able to reproduce or make a baby.”

There are three ways to create a pregnancy. We’re going to start with penis-in-vagina sex, which I will call PIV sex for short.”

*Note to the Teacher: It is likely that some students will react with embarrassment, discomfort, or disgust from the mention of sexual intercourse. Explain to students that this is an adult behavior and that because they are only in fifth grade, it is perfectly normal for them to think it is yucky or funny. Again, if you/your district prefers a different label, please substitute your language.*

*Note to the Teacher: As you go through the process of fertilization and pregnancy, use the diagrams of the sperm and egg/baby transportation systems to help to explain each of these processes. Details can be added from the teacher’s resources or excluded to meet the needs of the class and/or district and state policy.*

Say: “When puberty begins, testicles, which is where most of the hormone testosterone is produced, start to produce sperm. Sperm are tiny cells that are needed to reproduce. After sperm is made in the testicles they travel to the epididymis, where the sperm mature. When someone’s body is ready to send sperm on its way, the sperm travel from the epididymis through two narrow tubes called the vas deferens. While passing through the vas deferens, the sperm cells pick up a liquid that helps the sperm get to where they need to go to create a pregnancy. The combination of the sperm and this liquid is called semen. Semen passes through the urethra and can be released out of an opening at the tip of the penis. This is called ejaculation. But keep in mind that for someone to send sperm on its way, they usually have an erection, which is when the penis stands stiffly away from the body.

I just want to mention that urine, or pee, also passes through the urethra and comes out of the same opening in the penis, but never at the same time as semen.”

Next say: “Unlike testicles that begin to make sperm during puberty, eggs develop in the ovaries before someone is born. In fact, by the time a person with ovaries is born, they already have all the eggs they will ever have.

“When puberty begins, ovaries, which produce most of the hormone called estrogen, start to release an egg, about once a month. The process of the ovary releasing an egg is called ovulation. When ovulation occurs, the egg can enter the fallopian tube.

We’ll talk more about this in a minute, but, if there happens to be sperm in the fallopian tube when the egg is released into it, the sperm and egg have a chance to join together and start a pregnancy.

That is why right before the ovary releases an egg each month, the uterus starts to develop a thickened lining. The lining of the uterus thickens with extra blood and tissue, just in case there is a pregnancy.

But, if there is no pregnancy, which is most of the time, the uterus sheds its thickened lining of blood and tissue through the vagina, which is called menstruation or having a period.”

Ask, “Any questions about where sperm and eggs are made and how they move through the body?”

Continue. “Some of you may be wondering how sperm gets into the fallopian tube. One way is through PIV sex. This is when semen containing millions of sperm cells leaves the penis — when it is ejaculated — directly into the vagina.”

*Note to the Teacher: If a more descriptive answer is okay with your school/district, you can instead say, “PIV sex is when two people bring their bodies very close together and they guide the erect penis into the vagina. The movement of their bodies together causes sperm to be released into the vagina.”*

Say, “The sperm travel through the vagina, pass through the cervix which is the opening to the uterus, and into the fallopian tubes. Even though millions of sperm are ejaculated into the vagina, only one sperm can enter an egg and fertilize it.

It takes about a day for fertilization to happen. After the egg is successfully fertilized, it can start to divide. First the fertilized egg can divide in half to make two cells. Then both of those cells can divide in half to make four cells. Then the four cells can divide in half to make eight cells. As the cells continue to divide, they stay clumped together. We call this bundle of cells an embryo. While the embryo is developing into more cells, it tumbles through the fallopian tube toward the uterus. About a week later when it reaches the uterus, the embryo is about 100 cells big, and it can implant or attach to the wall of the uterus. This can be the start of a pregnancy. The uterus is where an embryo can develop into a fetus and if the pregnancy continues for about nine months, a baby is usually ready to be born.”

“Let me pause for a minute. Any questions about how PIV sex works to create a pregnancy?”

Ask, "So PIV sex is one way that sperm and egg can join together to start a pregnancy. Does anyone know other ways in which fertilization and pregnancy can happen?"

*Note to the Teacher: Students might say with help, with a doctor, assisted reproduction, technology, insemination, assisted insemination, artificial insemination, intrauterine insemination, IUI, in vitro fertilization, IVF, sperm or egg donors, embryo donation, surrogacy, gestational carriers, etc.*

Continue, "Great answers! Sometimes semen is released (or ejaculated), not into another person's body, but into a cup or container. Semen can be removed from the container and then placed into the vagina or the uterus. This is called insemination. It assists or helps the sperm in reaching the egg."

Continue, "Sometimes both semen and eggs are removed from the body and placed into a container. When sperm and egg cells are joined together outside of the body, this is called in vitro fertilization, or IVF for short."

*Note to Teacher: You can draw some simple illustrations on the dry erase board, of a container with sperm cells, egg cells, fertilized eggs (embryos), etc. Examples below.*

"PIV sex, insemination and IVF are three ways of joining egg and sperm cells and they can all create a pregnancy."

*Note to the Teacher: On the board or a flipchart, write all three words and a simple definition:*

<i>Sexual Intercourse</i>  <i>Fertilization happens inside the body, without help</i>	<i>Insemination</i>  <i>Fertilization happens inside the body, with help</i>	<i>In Vitro Fertilization (IVF)</i>  <i>Fertilization happens outside the body, with help</i>
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(15 minutes)

**STEP 5:** Tell students that they are now going to see what they remember about conception by placing the steps in the right order on a diagram. They will first do this activity for PIV sex, then insemination, then in vitro fertilization. This will help them understand the similarities and the differences between the different methods of fertilization.

Break up students into pairs or trios. Give each group a PIV sex conception worksheet and a stack of cards or slips of paper with the corresponding steps of conception on them. Explain to students that on the part of the “Y” marked “Sperm Transport,” they are to put the cards relating to the sperm part of reproduction in the correct order starting from the top (the first step is already there to help them). On the part of the “Y” marked “Egg Transport,” they are to put the cards relating to the egg part of reproduction in order following the first step. As students work on their diagrams, go around and offer assistance or clues to help them. (Alternatives: Depending on the need to assess students, this activity can be done independently so the teacher can assess students on an individual basis. Another option is to do this as a large group activity with the whole class. In such a situation, the teacher can make a giant diagram on the floor with chalk and enlarge the signs to have the class build a giant conception diagram).

(10 minutes)

**STEP 6:** Review the diagrams, correcting mistakes and reviewing information.

**STEP 7:** Have the students repeat the activity for insemination. The material may be familiar to some students and new to others, but they will now all be familiar with the activity. As students work on their diagrams, go around and offer assistance or clues to help them. Review the diagrams, correcting mistakes and reviewing information.

(6 minutes)

**STEP 8:** Have the students repeat the activity for in vitro fertilization. Again, the material may be familiar to some and new to others, but by now they are very familiar with the activity. As students work on their diagrams, go around and offer assistance or clues to help them. Review the diagrams, correcting mistakes and reviewing information.

(6 minutes)

**STEP 9:** Ask students, “What similarities and differences do you see with each of the ways to reproduce?”

Be sure to emphasize, “In the end, no matter which method is used, they can all result in a pregnancy.”

(2 minutes)

**STEP 10:** With any time remaining, ask students if they have any questions. Take as much time as possible to respond to their questions. Close by telling students that it is okay if they still have more questions. Tell them that they should go home and ask a trusted adult their questions. Remind them that they can always come to you or to the school nurse.

(5 minutes)

***Note to the Teacher:** Students at this age love to ask about twins, triplets (and more). Twins can happen with all means of reproduction. Either an individual sperm fertilizes an individual egg (fraternal twins), or a fertilized egg splits early in embryonic development and then those embryos go on to develop independently of one another. (identical twins). With IVF, sometimes two (or more) embryos are placed in the uterus. If they both implant, this leads to fraternal twins. Identical twins can also result from IVF, if an embryo splits.*

*This lesson does not go into details about why people use various means of reproduction or how donors and surrogates help to create pregnancies and grow families. These concepts are introduced in the lesson titled “RTF 3Rs Grade5 Supplement: So THAT’s How Babies are Made. Please read the RTF Educator’s Guide to Assisted Reproduction so that you can address donors and surrogates when students bring them up (and they usually do)!*

## **RECOMMENDED ASSESSMENT OF LEARNING OBJECTIVES AT CONCLUSION OF LESSON:**

The activities in step five through nine are designed to assess objectives one and two.

## **HOMEWORK:**

None.

## Steps to Human Reproduction Cards

### PIV Sex

Note to the Teacher: We have modified the descriptions from the original 3R curriculum, so that students can more clearly assess the similarities and differences between PIV sex, insemination, and IVF.

Note to the Teacher: Cut, mix up , and then put the pieces in a small envelope

Sperm is made in the testicles

Sperm leave the epididymis and travel through the vas deferens

Sperm mix with fluids, creating semen

Lining of the uterus thickens with blood and tissue

An egg is released from an ovary (ovulation)

Semen leaves the penis (ejaculation) and enters the vagina

Sperm travel through the body and into the fallopian tubes

A sperm fertilizes an egg in the fallopian tube creating an embryo

The embryo travels through the fallopian tube to the uterus

The embryo attaches to the wall of the uterus (implantation)

Pregnancy can begin



## Steps to Human Reproduction Cards

### Insemination

Note to the Teacher: We have modified the descriptions from the original 3R curriculum, so that students can more clearly assess the similarities and differences between PIV sex, insemination, and IVF.

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Sperm leave the epididymis and travel through the vas deferens

Sperm mix with fluids, creating semen

Lining of the uterus thickens with blood and tissue

An egg is released from an ovary (ovulation)

Semen leaves the penis (ejaculation) and enters a container

Sperm travel through the body and into the fallopian tubes

A sperm fertilizes an egg in the fallopian tube creating an embryo

The embryo travels through the fallopian tube to the uterus

The embryo attaches to the wall of the uterus (implantation)

Pregnancy can begin

## Steps to Human Reproduction Cards

### IVF

Note to the Teacher: We have modified the descriptions from the original 3R curriculum, so that students can more clearly assess the similarities and differences between PIV sex, insemination, and IVF.

Note to the Teacher: Cut, mix up , and then put the pieces in a small envelope

Sperm is made in the testicles

Sperm fertilize eggs in the Petri dish

Semen is ejaculated into a container or sperm are surgically removed from the body

Fertilized eggs begin developing into embryos

Sperm are prepared for fertilization

Embryos develop in the Petri dish for 3-5 days

An individual begins taking fertility medication to develop lots of eggs

An embryo is placed into the uterus which has developed a thickened lining

The eggs are surgically removed from the ovaries

The embryo attaches to the wall of the uterus (implantation)

The eggs are placed into a Petri dish

Pregnancy can begin



# Reproduction Worksheet

## PIV Sex

### Sperm Delivery

Sperm is made in the testicles

### Egg Delivery

Lining of the uterus thickens with blood and tissue

Pregnancy can begin



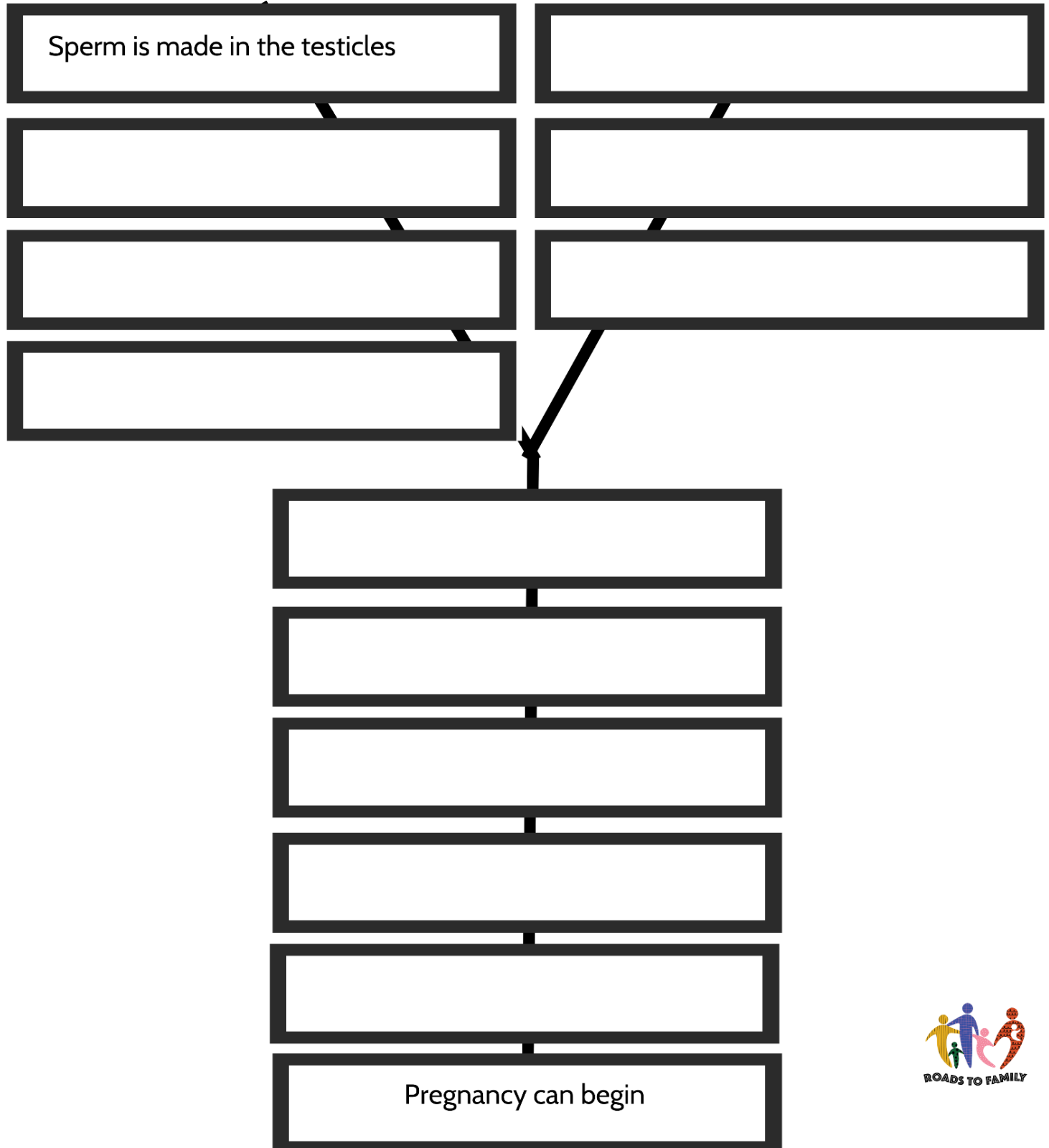


# Reproduction Worksheet

## Insemination

### Sperm Delivery

### Egg Delivery





# Reproduction Worksheet

## IVF

### Sperm Delivery

### Egg Delivery

Sperm is made in the testicles

An individual begins taking fertility medication to develop lots of eggs

Pregnancy can begin







# Reproduction Worksheet

## PIV Sex

### Sperm Delivery

Sperm is made in the testicles

Sperm leave the epididymis and travel through the vas deferens

Sperm mix with fluids, creating semen

### Egg Delivery

Lining of the uterus thickens with blood and tissue

An egg is released from an ovary (ovulation)

Egg enters the fallopian tube

Semen leaves the penis (ejaculation) and enters the vagina

Sperm travel through the body and into the fallopian tubes

A sperm fertilizes an egg in the fallopian tube creating an embryo

The embryo travels through the fallopian tube to the uterus

The embryo attaches to the wall of the uterus (implantation)

Pregnancy can begin

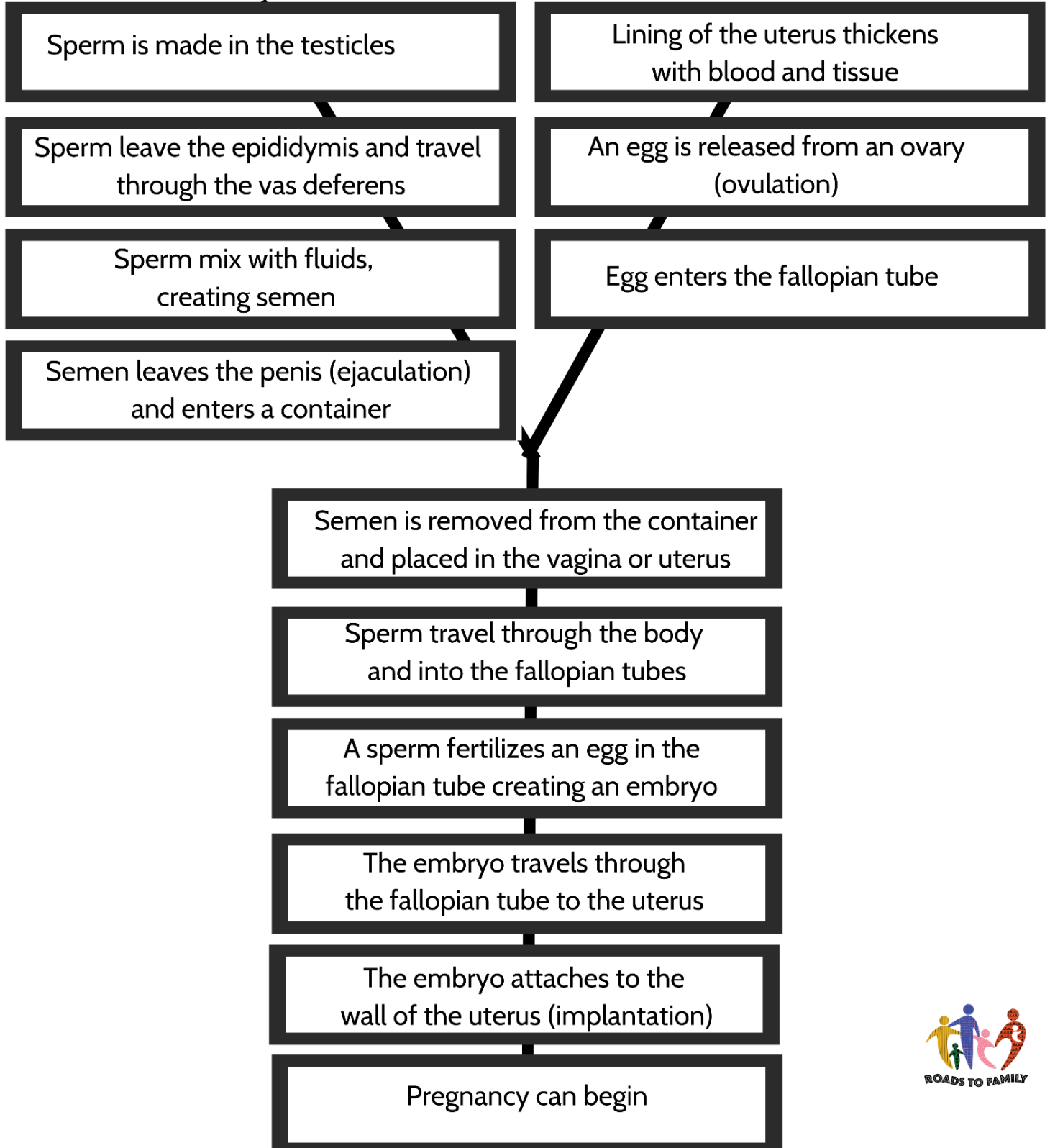


# Reproduction Worksheet

## Insemination

### Sperm Delivery

### Egg Delivery



# Reproduction Worksheet

## IVF

### Sperm Delivery

Sperm is made in the testicles

Semen is ejaculated into a container or sperm are surgically removed from the body

Sperm are prepared for fertilization

### Egg Delivery

An individual begins taking fertility medication to develop lots of eggs

The eggs are surgically removed from the ovaries

The eggs are placed into a Petri dish

Sperm fertilize eggs in the Petri dish

Fertilized eggs begin developing into embryos

Embryos develop in the Petri dish for 3-5 days

An embryo is placed into the uterus which has developed a thickened lining

The embryo attaches to the wall of the uterus (implantation)

Pregnancy can begin

