ONPRC Module 3B:
Assisted Reproductive Technologies (ART)

Guiding Question:

How can we use assisted reproductive technologies to preserve the endangered species?

Module Question	Laboratory Questions
How does learning about fertilization, embryonic development and assisted reproductive technologies create options for preserving fertility?	• How does fertilization happen in humans, in vivo and in vitro? Is it the same process in other non-human primates? • How do embryos develop? • How can we monitor pregnancy using ultrasound?

Learning Outcomes:

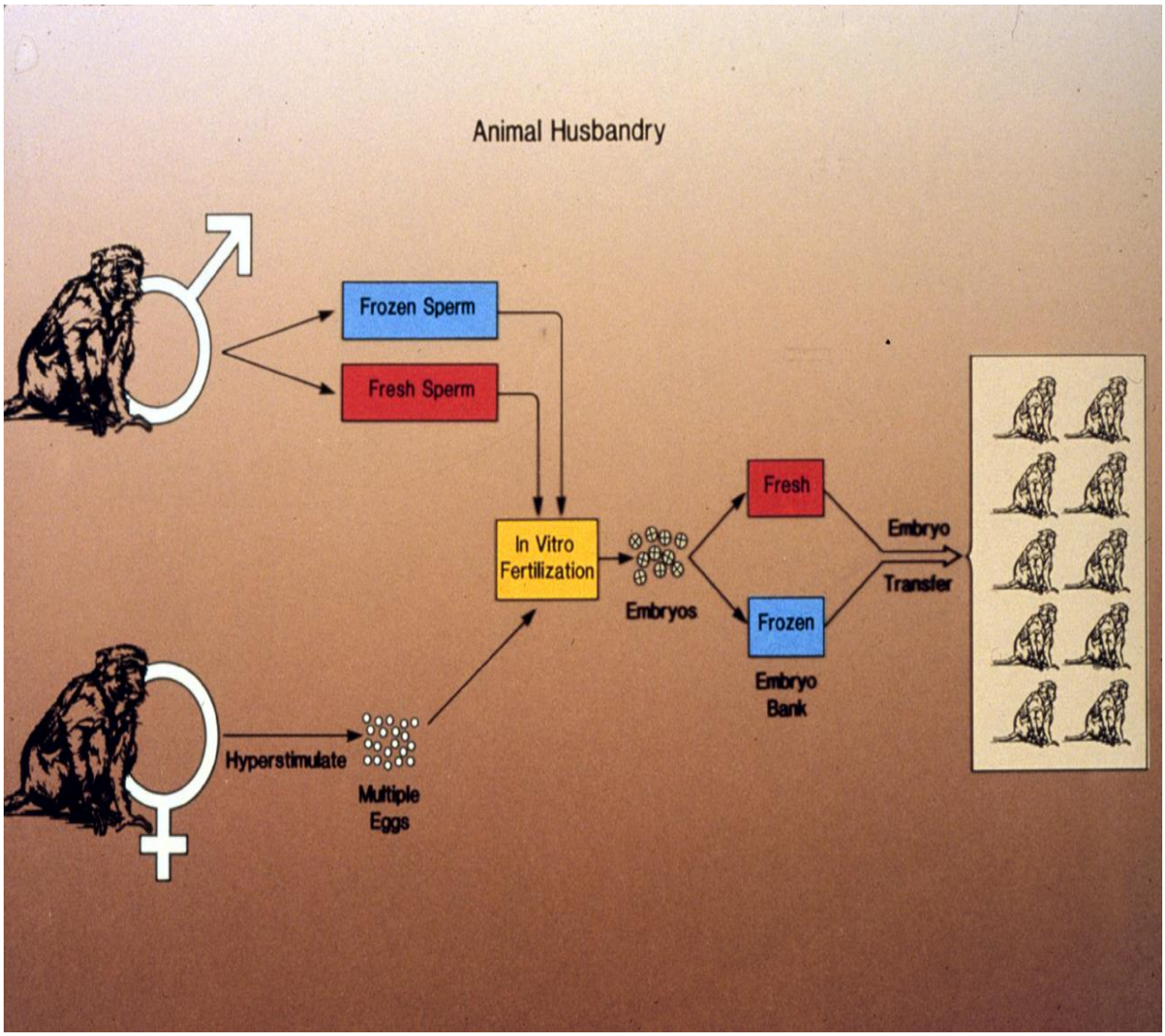
Describe the process of fertilization.

Describe embryonic and early fetal development.

Describe assisted reproductive technologies (artificial insemination, in vitro fertilization, intracytoplasmic sperm injection).

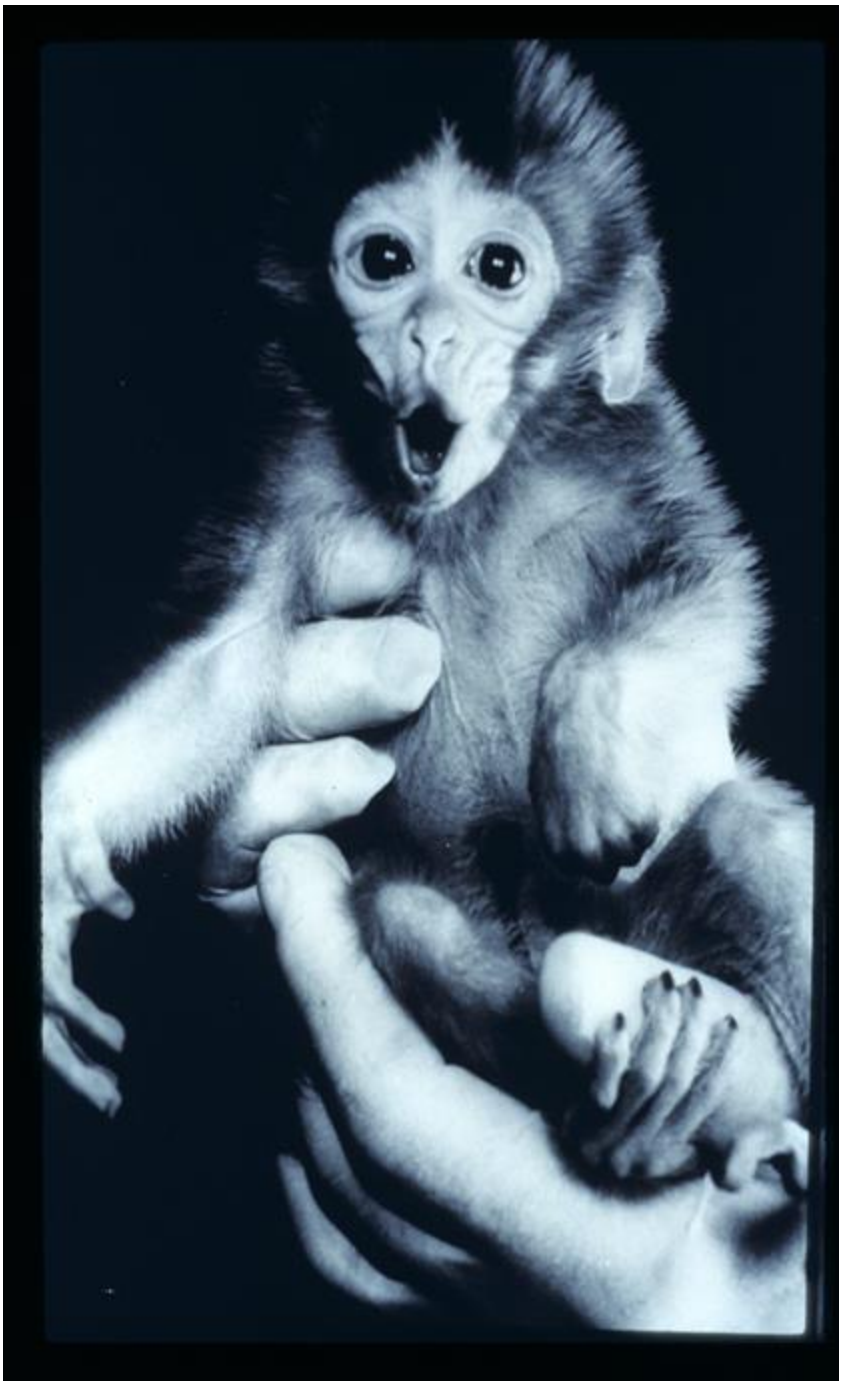
Describe how assisted reproductive technologies can help preserve endangered species.

In Vitro Fertilization Monkeys



Drawing: Dr. Joel Ito, ONPRC
Cartoon: Microsoft Clip Art

In Vitro Fertilization Monkeys



Shiver

First Rhesus monkey in the world born from *in vitro* fertilization, frozen-thawed embryo, 1988

Photo: ONPRC

Cartoon: Microsoft Clip Art

In Vitro Fertilization Monkeys

Arnold and Danny

First Rhesus monkey twins in the world born from ***in vitro*** **fertilization,** frozen-thawed embryos, 2003

Photo: ONPRC

Cartoon: Microsoft Clip Art

In Vitro Fertilization Gorilla

- Timu was the first Western lowland gorilla in the world born from ***in vitro* fertilization,** Cincinnati Zoo, 1996

- Now lives Henry Doorly Zoo, Omaha, Nebraska

- Had her own babies in August 2003 and in April 2005

Photo: Courtesy of Cincinnati Zoo

Cartoon: Microsoft Clip Art

Endangered Species

Orangutans are among the species whose populations are declining due to human activity.

***In vitro* fertilization** can be used to help bolster populations of endangered species.

Photo and Cartoon: Microsoft Clip Art