






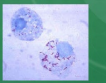
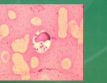

VIRUSES

Alive? Or Not?

[Video](#)

WHAT IS A VIRUS?

Pathogen: any living organism or particle that causes disease

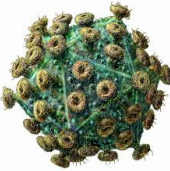
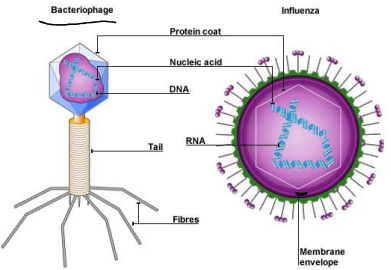
 BACTERIA	 VIRUS	 FUNGI
 RICKETTSIAE	 PROTOZOA	 PARASITICWORMS

Viruses are **particles** that cause disease.

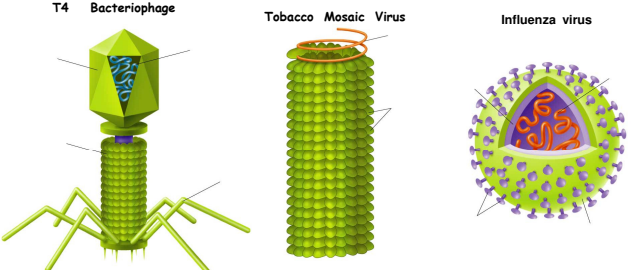
VIRUS STRUCTURE

3 parts of a Virus:

1. Protein Coat - *Capsid*
2. Membrane Envelope
3. DNA or RNA

Viruses come in a variety of sizes and shapes



A typical virus is composed of a core of either DNA or RNA, surrounded by a protein coat, or capsid

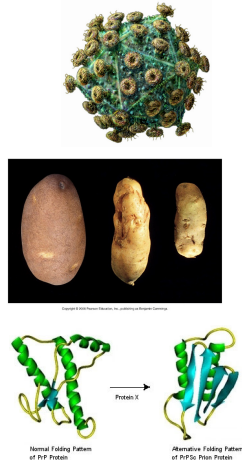
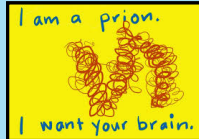
OTHER DISEASE PARTICLES

Retrovirus: viruses that contain RNA and produce their own DNA (some times of cancer & HIV)

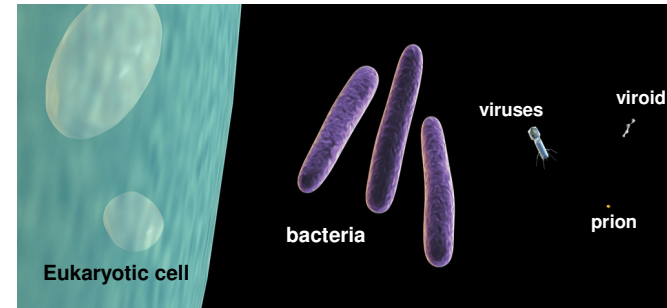
Viroid: particle that causes disease in plants

Prion: particle that causes disease by causing proteins in the infected organism to fold incorrectly; only made of protein (mad cow disease)(Kuru)

- Always fatal



SIZE OF STRUCTURES



Are viruses alive?

Virus

No life functions: no growth/development, no use of energy, no response to environment, etc.

Reproduction requires a host cell to carry out

Structurally, only made up of a capsid surrounding a nucleic acid

Living Cell

Carries out all life functions

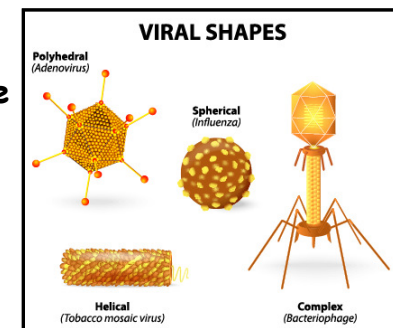
Reproduction does not require the use of a host cell

Cellular structure with parts of a cell

What do different viruses have in common?

1. Very small
2. Structure/Shape

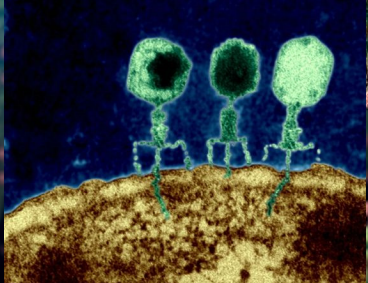
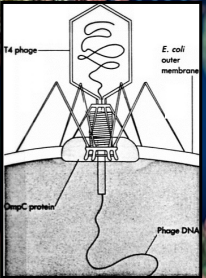
*The structure & shape of a virus determines what kind of host it infects and how it infects that host.



Host = cell that is infected

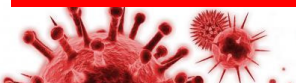
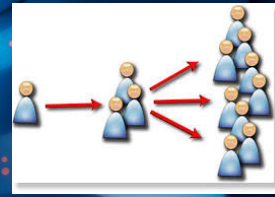

Bacteriophages

- Viruses that infect bacteria
- Enter a bacteria cell by injecting their genetic material into the cell

HOW DO VIRUSES ENTER OUR BODIES?

- Cuts/scrapes
- Mouth, nose, genital area, eyes, ears


Ebola

How are virus-caused illnesses prevented?

Vaccines

The injection of a killed or weakened virus that produces immunity (antibodies) in the body against that virus.


- Stimulate the immune system to recognize and destroy viruses



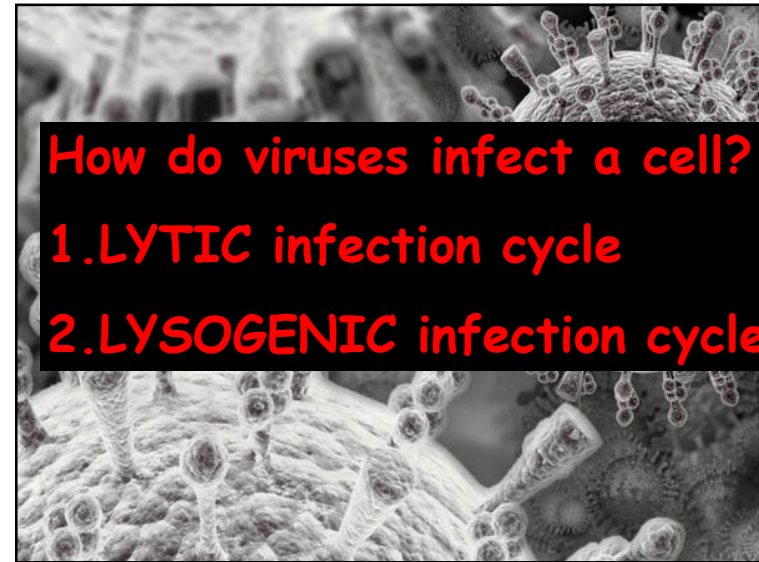
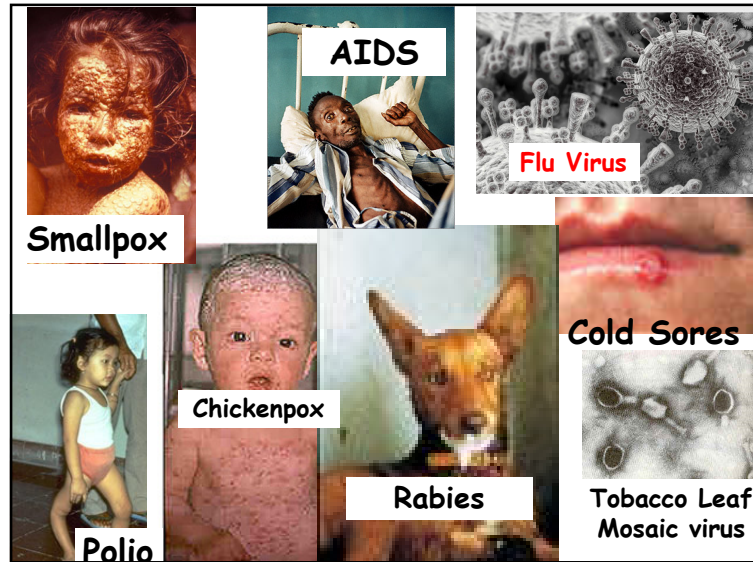
vaccines
WHAT DOES MY DOG NEED?

Age Vaccine	Birth	2 Mos	4Mos	6 Mos	12 Mos	18 Mos	5 - 6 Years
BCG	BCG						
Diphtheria, Pertussis, Tetanus		Dtap	Dtap	Dtap		Dtap	DPT
Haemophilus Influenza Type b		Hib	Hib	Hib		Hib	
Hep. B	HBV	HBV	HBV	HBV			
Polio		IPV	OPV	OPV		OPV	OPV
Pneumococcal		PCV	PCV	PCV		PCV	
Measles, Mumps, Rubella					MMR		MMR
Varicella					Varicella		Varicella

■ Combined Dose ■ Single Dose



Viruses in plants can be very costly and destructive.



LYTIC Infection

In a LYTIC infection what 3 things happen?

1. A virus enters a cell
2. Makes copies of itself
3. Causes the cell to burst

The Lytic Cycle

New viruses erupt from the cell to infect other cells

The virus attaches to the cell's wall or cell membrane

The virus injects DNA into the cell

The virus takes over the cell's chemistry, causing the cell to start making virus parts.

New viruses are assembled ↑

LYSOGENIC Infection

In a Lysogenic infection cycle, what happens?

1. Viral DNA enters a host cell and inserts itself into the host's DNA

AND

Just sits there until a "trigger" makes it go into the lytic cycle.

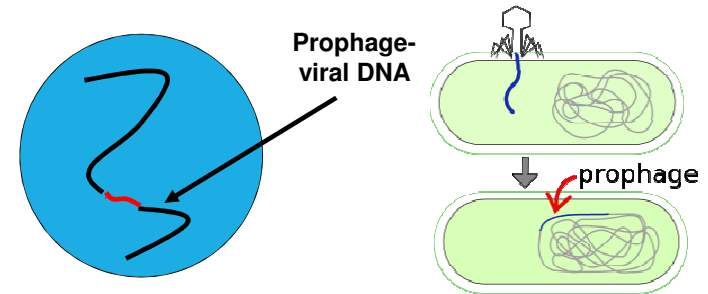
This may take years

So, every time the cell divides, the virus DNA divides.

Animation

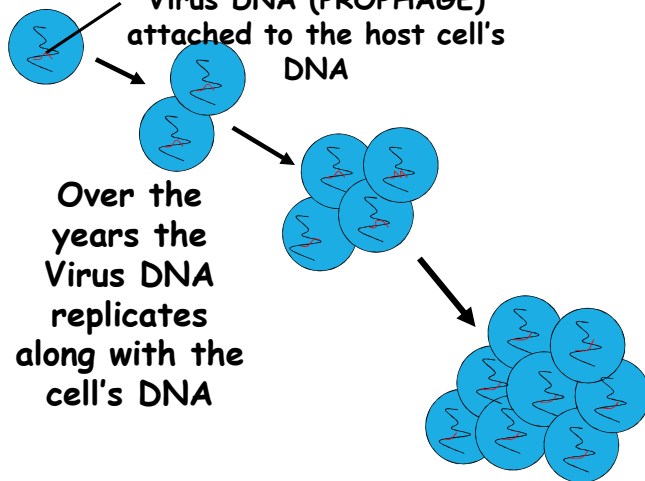
The viral DNA that is embedded in the host's DNA is called a

Prophage



Virus DNA (PROPHAGE) attached to the host cell's DNA

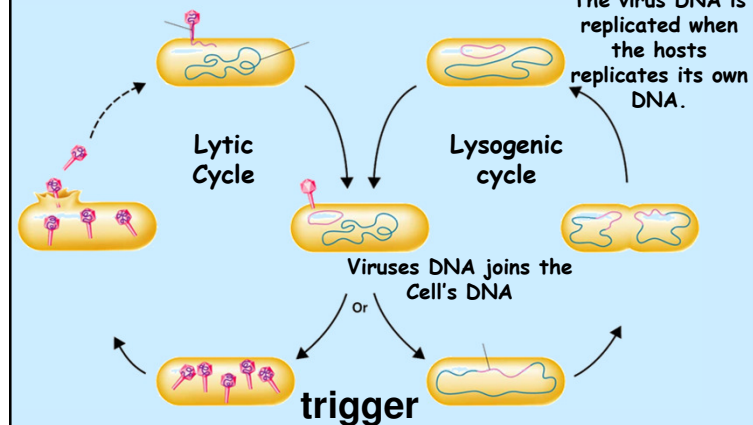
Over the years the Virus DNA replicates along with the cell's DNA



The Lysogenic Cycle

Virus injects its DNA into cell

The virus DNA is replicated when the hosts replicates its own DNA.



NPR video
Ted talk Video