

Science 9 Unit 2 Review Package

Cell Division review

1. State 3 functions of cell division?
2. Explain why cells are limited to a maximum size and can't keep growing to be huge.
3. Provide an example of an organism that results in a clone due to cell division.

Cell anatomy (Be able to correctly label animal and plant cells)

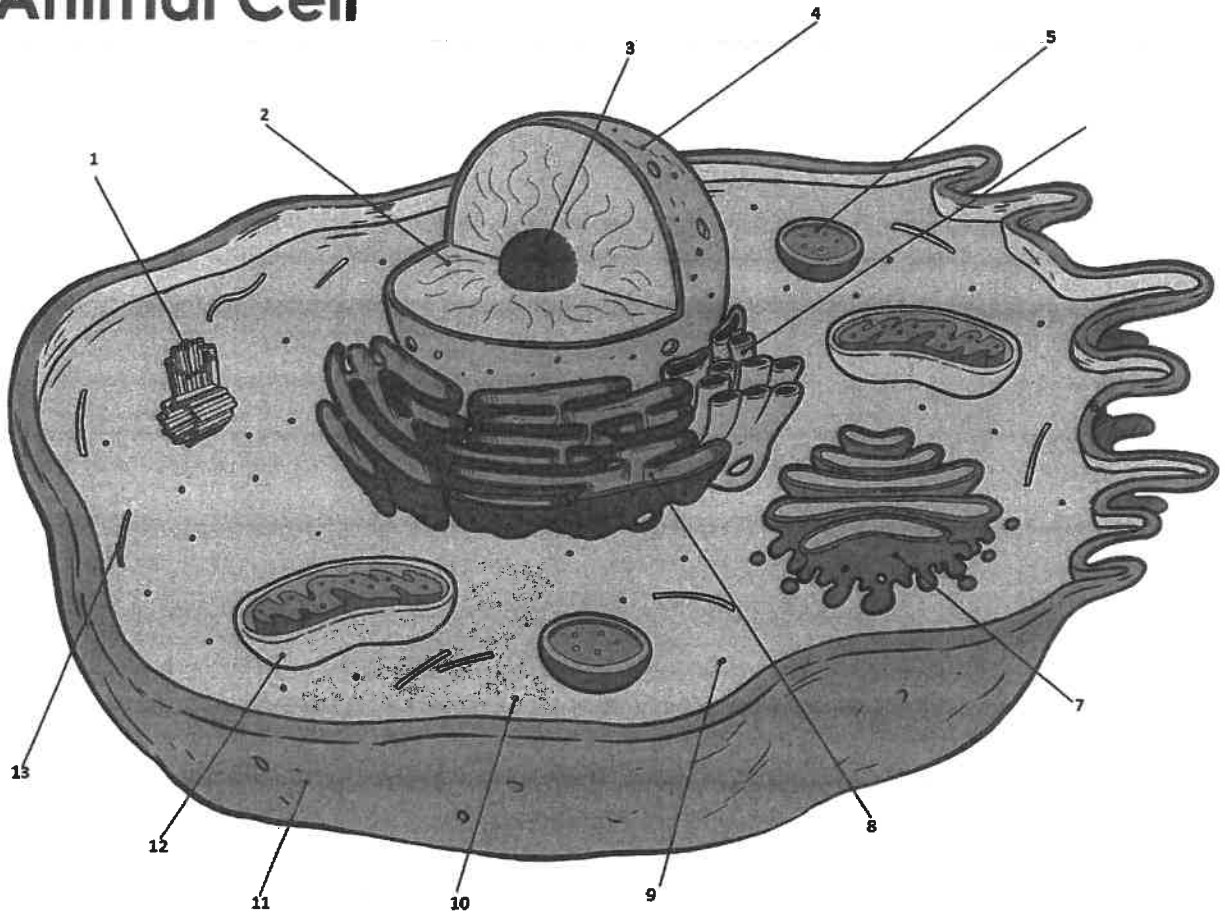
1. What is the function of the following organelles:
 - a. Nucleus
 - b. Nucleolus
 - c. Rough endoplasmic reticulum
 - d. Smooth endoplasmic reticulum
 - e. Golgi body
 - f. Mitochondria
 - g. Centrioles
 - h. Chloroplasts
 - i. Cell membrane
 - j. Cell wall
 - k. Microtubules
 - l. Ribosomes
 - m. Cytoplasm
 - n. Vacuole

DNA Review

1. Write out the full name for DNA.
2. Describe what a gene is.
3. Where in the cell are chromosomes located?
4. What is the shape of DNA?
5. What are the 3 major components of a nucleotide?
6. Which part(s) of nucleotides make up the sides of a DNA molecule?
7. What are the "rungs" of the DNA "ladder" made up of?
8. What is the sugar found in DNA?

9. Describe which pairs of bases bond (connect together) in DNA.
10. DNA is made of sub-units called _____?
11. Why is RNA necessary to act as a message for DNA? In other words, why can't DNA be used directly to code for protein?
12. Where are proteins made in the cell?
13. Proteins are made of sub-units called _____?
14. How do some cells become brain cells, muscle cells, stomach cells, and skin cells when they all contain identical DNA?
15. Why is DNA often referred to as the blueprint of life?
16. What organelle is responsible for "reading" the RNA message?
17. State 2 locations in a cell where protein synthesis (i.e., protein making) occurs.
18. The type of amino acid used in protein synthesis is determined by groups of 3 bases called _____?
19. How do DNA, chromatin and chromosomes differ? What's the same about all three?
20. What is the human genome?
21. State 3 types of mutations and provide an example of each.
22. State several factors that increase risk for cancer.

Animal Cell

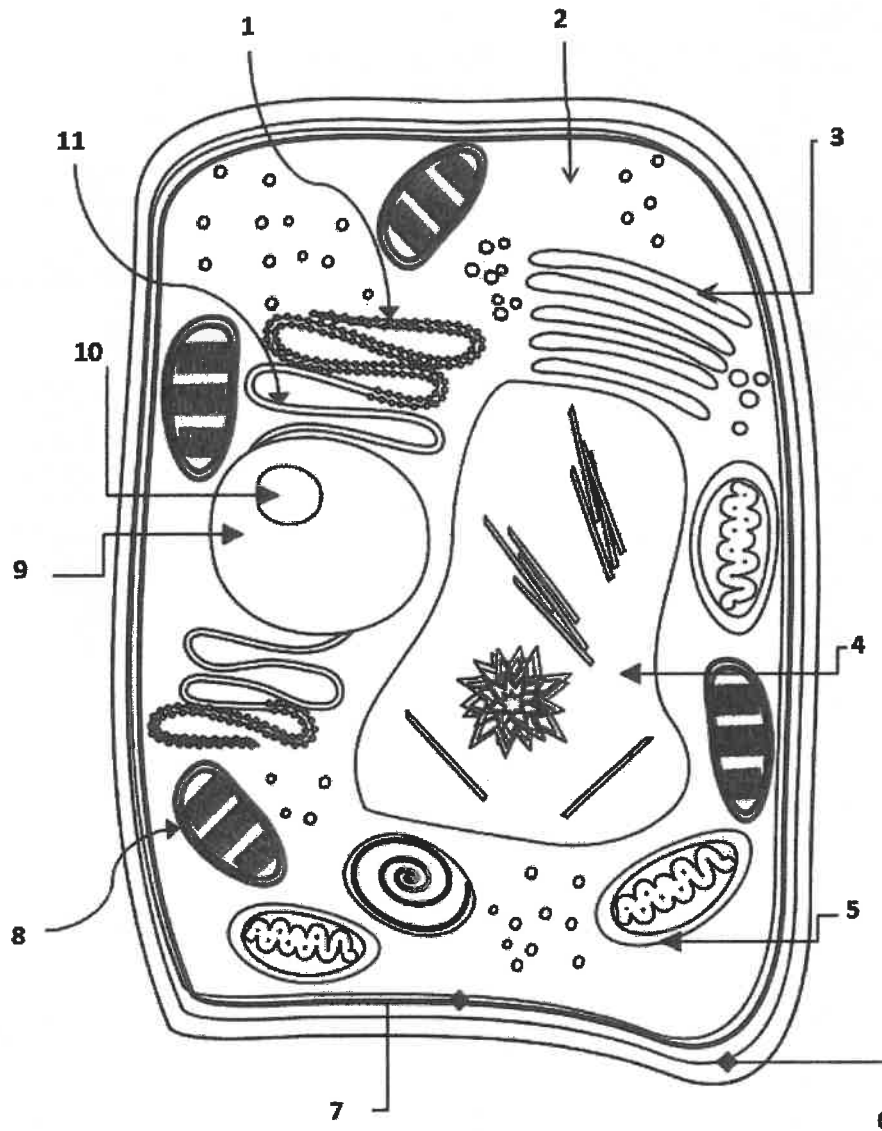


Label the animal cell using the numbers below

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

9. _____
10. _____
11. _____
12. _____
13. _____

Plant Cell



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

8. _____
9. _____
10. _____
11. _____

MITOSIS WORKSHEET

Name: _____

Matching: match the term to the description

A. Prophase **B.** Interphase **C.** Telophase **D.** Metaphase **E.** Anaphase

- _____ 1. The sister chromatids are moving apart.
- _____ 2. The nucleolus begins to fade from view.
- _____ 3. A new nuclear membrane is forming around the chromosomes.
- _____ 4. The cytoplasm of the cell is being divided.
- _____ 5. The chromosomes become invisible.
- _____ 6. The chromosomes are located at the equator of the cell.
- _____ 7. The nuclear membrane begins to fade from view.
- _____ 8. The division (cleavage) furrow appears.
- _____ 9. The chromosomes are moving towards the poles of the cell.
- _____ 10. Chromatids line up along the equator.
- _____ 11. The spindle is formed.
- _____ 12. Chromosomes are not visible.
- _____ 13. Cytokinesis is completed.
- _____ 14. The cell plate is completed.
- _____ 15. Chromosomes are replicated.
- _____ 16. The reverse of prophase.
- _____ 17. The organization phase.

Fill in the blank: (drag/drop or write the word) Some will be used more than once.

- | | | | |
|----------------------|----------------------|-----------------------|-------------------------|
| A. Prophase | D. Metaphase | G. Chromatid | J. Spindle fiber |
| B. Interphase | E. Anaphase | H. Cytokinesis | K. Cell Plate |
| C. Telophase | F. Centromere | I. Mitosis | |

- _____ 18. What phase are daughter cells in as a result of mitosis?
- _____ 19. During what phase of mitosis do centromeres divide and the chromosomes move toward their respective poles?
- _____ 20. What is the phase where chromatin condenses to form chromosomes?
- _____ 21. What is the name of the structure that connects the two chromatids?
- _____ 22. In a chromosome pair connected by a centromere, what is each individual chromosome called?
- _____ 23. What are the two parts of cell division?
- _____
- _____ 24. What structure forms in prophase along which the chromosomes move?
- _____ 25. Which phase of mitosis is the last phase that chromatids are together?
- _____ 26. Which phase of the cell cycle is characterized by a non-dividing cell?
- _____ 27. What structure is produced when protein fibers radiate from centrioles?
- _____ 28. What forms across the center of a cell near the end of telophase?
- _____ 29. The period of cell growth and development between mitotic divisions?
- _____ 30. What is the phase where cytokinesis occurs?

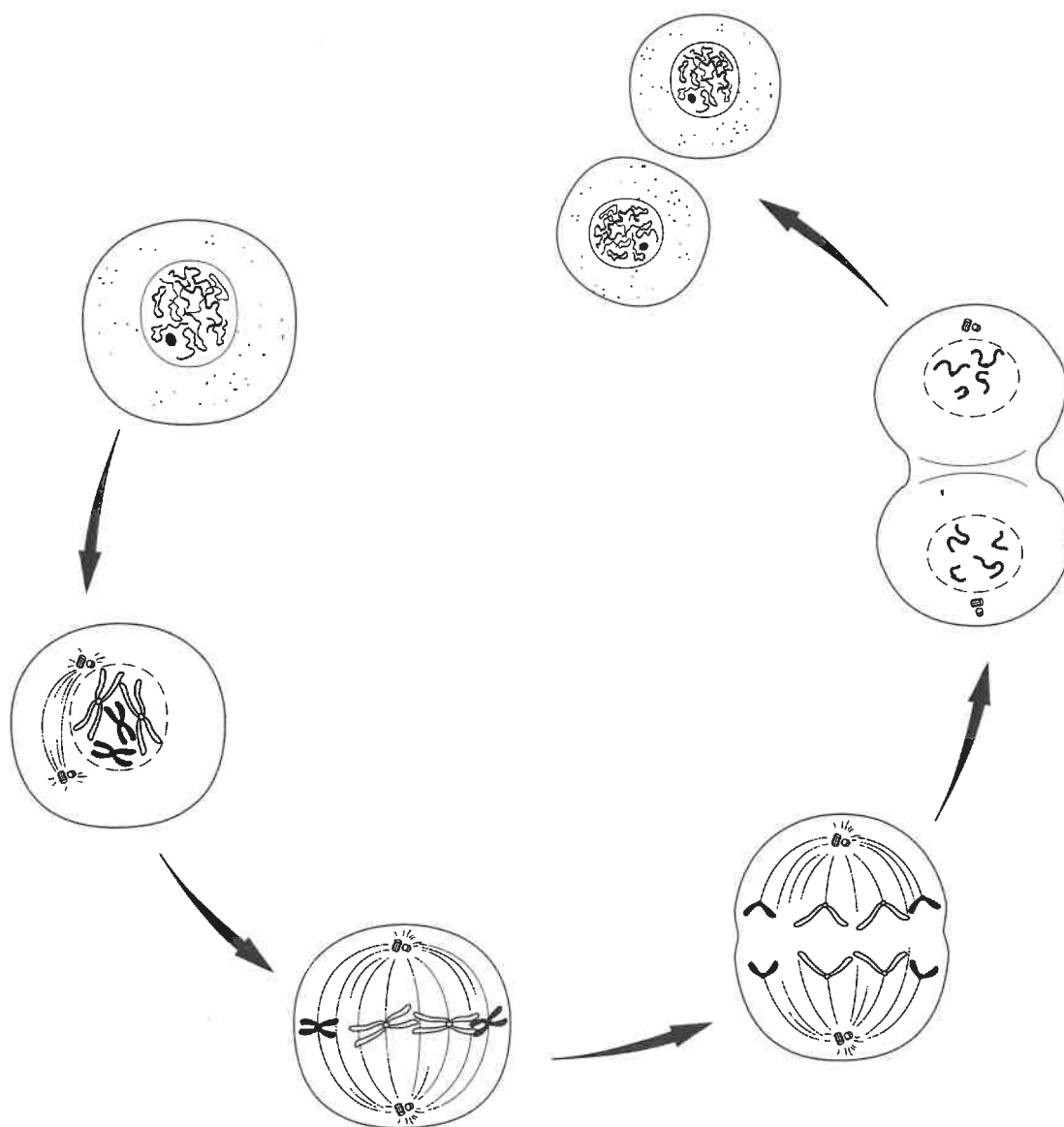
Name: _____

Date: _____

2.4

Stages of Cell Division

Note the stages of cell division and label them.



Name: _____ Date: _____

Chapter 2 Quiz

Part A: Modified True/False

Indicate whether each statement is true or false. If false, change the underlined word or phrase to make the statement true.

- _____ 1. Multicellular organisms grow by increasing the size of their cells. _____
- _____ 2. Instructions for all cell activities are coded for by proteins. _____
- _____ 3. The stage of the cell cycle in which a cell is not actively dividing is known as interphase. _____
- _____ 4. A change in a cell's genes is known as a cancer. _____
- _____ 5. A cancer tumour that does not interfere with the cells around it is known as a benign tumour. _____

Part B: Completion

Complete the following sentences.

6. If one cell undergoes division and continues to do so for five divisions, there will be _____ cells.
7. The part of the cell that contains all of the materials needed to make ribosomes is known as the _____.
8. A chemical substance that can cause cancer is known as a _____.
9. A cancerous tumour may spread to other parts of the body by the process of _____.

Part C: Matching

Match each of these words to their correct description.

- | | |
|------------------------|--|
| _____ 10. chromosomes | (a) provide energy for the cell |
| _____ 11. mitochondria | (b) location of most cell activity including absorbing, moving, and processing materials |
| _____ 12. ribosomes | (c) contain genes |
| _____ 13. cytoplasm | (d) produce proteins |

Chapter 2 Quiz (continued)

Part D: Multiple Choice

Circle the letter beside the answer that best completes the statement or answers the question.

14. Cell division is used for

- (a) reproduction
- (b) growth
- (c) repair
- (d) all of the above

15. Mitosis proceeds through a series of stages. These, in order, are

- (a) interphase, metaphase, prophase, telophase
- (b) prophase, metaphase, anaphase, telophase
- (c) prophase, anaphase, metaphase, telophase
- (d) metaphase, telekinesis, prophase, cytokinesis

16. The stage of mitosis during which the cytoplasm is divided into two parts is called

- (a) cytokinesis
- (b) telophase
- (c) interphase
- (d) binary fission

17. Some animals are able to replace lost limbs or other body parts. This ability is called

- (a) fragmentation
- (b) vegetative reproduction
- (c) budding
- (d) regeneration

18. Which of the following statements about DNA is **not** true?

- (a) The DNA molecule can make a copy of itself.
- (b) The DNA molecule looks like a twisted ladder (double helix).
- (c) In DNA, adenine is always paired with guanine.
- (d) There are only four nitrogenous bases available to form DNA.

Part E: Short Answer

Use sentences to answer the following questions.

19. At some time in your life, you cut yourself on a piece of glass or some other sharp object. In one or two sentences, explain why that cut is no longer bleeding, and the role of cell division in the process of healing.

20. Explain what fragmentation is. Name one organism that can reproduce via fragmentation with regeneration.

1.2 Assessment

Match each term on the left with the best description on the right. Each description may be used only once.

Term	Description
1. ____ clone	A. identical copy of a cell
2. ____ spore	B. series of events that make up the life cycle of a cell
3. ____ budding	C. structure released by a sporangium during asexual reproduction
4. ____ cell cycle	D. type of asexual reproduction where a bud forms from the parent
5. ____ binary fission	E. type of asexual reproduction where plants grow from parts of its roots, stems, or leaves
6. ____ vegetative propagation	F. type of asexual reproduction where the parent cell splits into two identical daughter cells

Circle the letter of the best answer for questions 7 to 23.

7. In which of the following methods of reproduction are the parent cells genetically identical to the daughter cells?

I	budding
II	binary fission
III	spore formation

- A. I and II only
B. I and III only
C. II and III only
D. I, II, and III
8. What do budding, binary fission, and spore formation have in common?
- A. They require two parent cells.
B. They require only one parent cell.
C. They produce only one daughter cell.
D. They are all forms of sexual reproduction.
9. Which of the following methods do bacteria that cause tooth decay use to reproduce?
- A. budding
B. binary fission
C. spore formation
D. vegetative propagation

10. What are the end products of binary fission?
- A. two independent daughter cells that are identical to each other
 - B. one daughter cell that is genetically different from the parent cell
 - C. two independent daughter cells that are different from each other
 - D. two daughter cells that are genetically different from the parent cell
11. Yeast reproduce by
- A. budding.
 - B. binary fission.
 - C. spore formation.
 - D. vegetative propagation.
12. During budding, what is usually formed?
- A. a bud from the daughter cell
 - B. new DNA from the parent cell
 - C. an outgrowth from the parent cell
 - D. new stems and roots from the parent cell
13. Which method does mould use to produce more mould on a piece of cheese?
- A. budding
 - B. binary fission
 - C. spore formation
 - D. vegetative propagation
14. Which of the following describes when spores will grow and divide?
- A. when they are encased in a sporangium
 - B. when they are in an environment with harsh conditions
 - C. when they are in an environment with favourable conditions
 - D. when leaves from the existing plant provide nutrients for the spores
15. Which of the following types of reproduction involve the cell cycle?

I	budding
II	binary fission
III	spore formation

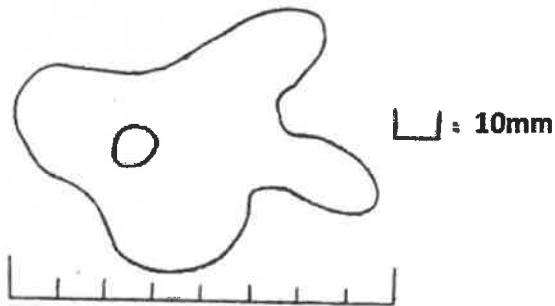
- A. I and II only
- B. I and III only
- C. II and III only
- D. I, II, and III

16. Daffodil and tulip bulbs are planted in the fall. In the spring, these flowers grow from the bulbs. This is an example of
- A. budding.
 - B. binary fission.
 - C. spore formation.
 - D. vegetative propagation.
17. How are potato tubers and strawberry runners similar?
- A. They are not clones of the parent plant.
 - B. They are like stems that produce new plants.
 - C. They are used by plants to reproduce sexually.
 - D. They are like leaves that develop the roots of the new plant.
18. Which of the following techniques takes a section of the root and joins it to another plant?
- A. cutting
 - B. grafting
 - C. splitting
 - D. air layering
19. The cell cycle consists of which of the following?
- | | |
|-----|-------------|
| I | mitosis |
| II | interphase |
| III | cytokinesis |
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II, and III
20. During which phase of mitosis do the chromosomes line up in the middle of the cell?
- A. telophase
 - B. anaphase
 - C. prophase
 - D. metaphase

Microscope worksheet

A student viewed an amoeba using a microscope.

She drew the following picture:



What is the size of the drawing? _____ mm

Calculate the magnification of the drawing if:

The amoeba is observed under high power (40X objective lens)

The ocular lens = 5X

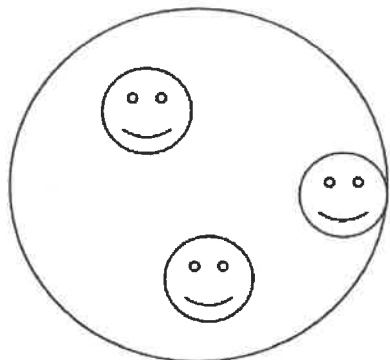
The low power objective lens = 4X with FOV = 4.2 mm

The amoeba fits across the high power FOV 4.5 times.

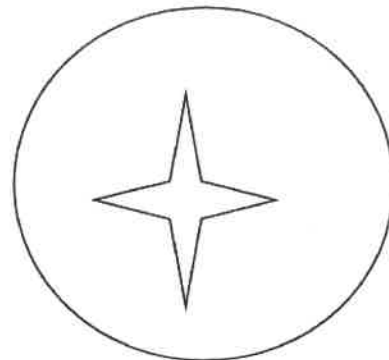
1. First determine the magnification on low power and high power.
2. Divide the high-power magnification by low power magnification.
3. Use the value in question #2 to determine the FOV on high power.
4. Determine the actual size of the amoeba under high power (remember, it fits across the FOV 4.5 times.)
5. Determine the magnification of the diagram by dividing this measurement by the actual size of the amoeba determined in question #4.

4. Calculate the actual size of one cell in each of the following microscope images, as seen on low power. Assume the FOV is 5.0 mm.

A.



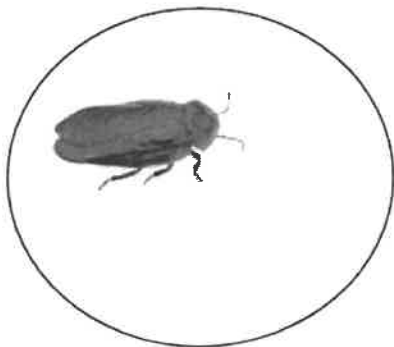
B.



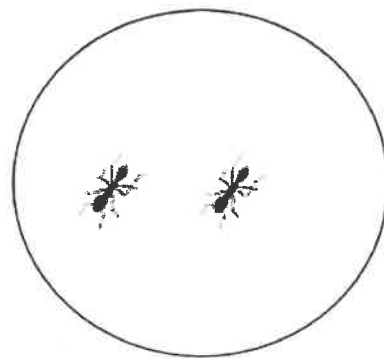
Actual size of one cell: _____ mm

Actual size of one cell: _____ mm

C.



D.



Actual size of one cell: _____ mm

Actual size of one cell: _____ mm

5. Determine the diameter of ONE onion cell shown using the following microscope drawing where the diameter of the field of view is 3.7 mm on low power.

