

## حل أسئلة درس تصوير الحركة



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المزيد من مادة  
فيزياء:

### التواصل الاجتماعي بحسب الصف التاسع



صفحة المناهج  
الإماراتية على  
فيسبوك

### المزيد من الملفات بحسب الصف التاسع والمادة فيزياء في الفصل الأول

|                                                                   |   |
|-------------------------------------------------------------------|---|
| حل أسئلة درس الموقع والزمن                                        | 1 |
| حل أسئلة درس الرسوم البيانية للموقع والزمن                        | 2 |
| حل أسئلة درس السرعة والسرعة المتجهة                               | 3 |
| شرح مفاهيم التسارع ومخططات الحركة                                 | 4 |
| شرح أساسيات السرعة والسرعة المتجهة والرسوم البيانية للموقع والزمن | 5 |

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تطبيق المناهج على Store App (آبل)

# GRADE 9 PHYSICS — WORKSHEET SOLUTIONS

## Unit 2 • Lesson 1: Picturing Motion | Comprehensive Answer Key & Explanations

Student Name: \_\_\_\_\_

Grade: Grade 9 Physics

Date: \_\_\_\_\_

### CORE CONCEPTS & DEFINITIONS IN LESSON 1

- **Motion:** A change in the position of an object relative to a stationary reference frame.
- **Motion Diagram:** A series of images showing the positions of a moving object at equal time intervals.
- **Particle Model:** A simplified motion diagram where the moving object is replaced by a single point (dot) at its center of mass for each equal time interval.
- **Interpreting Dot Spacing:**
  - *Equal spacing between dots:* Constant speed.
  - *Dots getting farther apart:* Speed is increasing (acceleration).
  - *Dots getting closer together:* Speed is decreasing (deceleration/slowing down).

### WORKSHEET PRACTICE QUESTIONS & DETAILED SOLUTIONS

**Q1. Which of the following motion diagrams correctly matches the motion of the flying bird shown in the worksheet figure (flying horizontally at a constant speed)?**

- A. Dots getting closer together moving to the right      **B. Dots evenly spaced at equal distance intervals**  
 C. Dots getting farther apart moving to the right      D. A single stationary dot

#### Detailed Solution & Reasoning:

**Correct Answer: B. Dots evenly spaced at equal distance intervals**

**Reasoning:** In the worksheet figure (Figure 4), the bird flies at a constant speed. When an object moves at a constant speed, it covers equal distances in equal time intervals. Therefore, its particle-model motion diagram consists of dots that are evenly spaced.

**Q2. Based on a particle-model motion diagram where the dots (and velocity arrows) get progressively closer together moving to the right, which statement is correct regarding the object's motion?**

- A. The object moves at a constant speed      B. The object accelerates (speed increases)  
**C. The object decelerates (speed decreases)**      D. The object accelerates at first, then decelerates

#### Detailed Solution & Reasoning:

**Correct Answer: C. The object decelerates (speed decreases)**

**Reasoning:** As the object moves forward, if the distance between successive points decreases in equal time intervals, it means the object covers less distance in each time step. This clearly indicates that the object is **slowing down** (decelerating).

**Q3. Based on a particle-model motion diagram where all dots are placed at equal distance intervals, which statement is correct regarding the object's motion?**

- A. The object accelerates  
B. The object moves at a constant speed  
C. The object is stationary  
D. The object decelerates

**Detailed Solution & Reasoning:**

**Correct Answer: B. The object moves at a constant speed**

**Reasoning:** Equal spacing between successive dots captured at equal time intervals means the object travels the exact same distance in every time step. This is the defining characteristic of **constant (uniform) speed**.

**Q4. A toy car is moving to the left toward a STOP sign and slowing down. Which particle-model motion diagram correctly represents the car's motion?**

- A. Dots spaced farther apart near the STOP sign (left)  
B. Dots spaced evenly throughout the diagram  
C. Dots getting progressively closer together as the car approaches the STOP sign (left)  
D. Dots with random unpatterned spacing

**Detailed Solution & Reasoning:**

**Correct Answer: C. Dots getting progressively closer together as the car approaches the STOP sign (left)**

**Reasoning:** As the car approaches the STOP sign, it applies its brakes and slows down. Moving from right to left (toward the stop sign), the spacing between dots must become **smaller and smaller** (closer together).

**Q5. Representing an object's motion using a successive series of single points (dots) placed at equal time intervals is called:**

- A. The particle model  
B. A data table  
C. A pictorial representation  
D. A (position – time) curve

**Detailed Solution & Reasoning:**

**Correct Answer: A. The particle model**

**Reasoning:** By definition, replacing a complex moving object with a sequence of single center-of-mass points (dots) captured at equal time intervals is called the **particle model**.

**Q6. When drawing a particle model for an object's motion, if the dots are close together at the beginning and then spread farther apart, the object is:**

- A. Stationary  
B. Accelerating (speeding up)  
C. Decelerating (slowing down)  
D. Moving at a constant speed

**Detailed Solution & Reasoning:**

**Correct Answer: B. Accelerating (speeding up)**

**Reasoning:** Increasing distance between dots in equal time intervals indicates that the object covers more distance in each successive step, which means its speed is increasing (the object is **accelerating**).

**Q7. The figure shows successive positions of Car 1 and Car 2 along a straight line. Car 1 has large, equal spacing between positions. Car 2 has small, equal spacing between positions. Which statement is correct?**

- A. Both cars are decelerating  
 B. Both cars are moving at a uniform speed (Car 1 faster than Car 2)  
 C. Car 1 is accelerating and Car 2 is decelerating  
 D. Both cars are accelerating

**Detailed Solution & Reasoning:**

**Correct Answer: B. Both cars are moving at a uniform speed (Car 1 faster than Car 2)**

**Reasoning:** Because the spacing for Car 1 is constant, Car 1 moves at a uniform (constant) speed. Because the spacing for Car 2 is also constant, Car 2 also moves at a uniform speed. Since Car 1 has wider spacing, Car 1 moves at a higher constant speed than Car 2.

**Q8. Which statement is correct regarding a particle-model motion diagram for an airplane flying at a constant speed of 850 km/h?**

- A. The points will start close together and get farther apart  
 B. The points will start far apart and get closer together  
 C. The points will alternate between close and far apart  
 D. The points will be evenly spaced, consistently, throughout the diagram

**Detailed Solution & Reasoning:**

**Correct Answer: D. The points will be evenly spaced, consistently, throughout the diagram**

**Reasoning:** A constant speed of 850 km/h means the airplane covers exactly equal distances in equal time intervals. Therefore, all dots in its particle model will be **consistently evenly spaced**.

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