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|  | Question: Are distance and time important when describing motion?  DESCRIBING MOTION | | |  |
|  |  | | |  |
|  | Motion — | | |  |
|  |  | | |  |
|  | DISTANCE VS. DISPLACEMENT | | |  |
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|  |  | | |  |
|  | Distance — | | |  |
|  | Displacement — | | |  |
|  |  | | |  |
|  | SPEED | | |  |
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|  |  | | |  |
|  | Speed – | | |  |
|  |  | | |  |
|  |  | | |  |
|  | Avg Speed (v) = total distance (d)/total time (t)  V = d/t | | |  |
|  |  | | |  |
|  |  | | |  |
|  | Type of Speed | Description | Example |  |
|  | INSRANTANEOUS |  | Driving a car and |  |
|  |  |  | looking down at |  |
|  |  |  | speedometer |  |
|  | AVERAGE | Total distance |  |  |
|  |  | traveled divided by |  |  |
|  |  | total time |  |  |
|  |  |  |  |  |
|  | CONSTANT |  |  |  |
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|  | GRAPHING MOTION |  |
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|  |  |  |
|  | Y  E  C  N  A  T  S  I  D |  |
|  |  |  |
|  |  |  |
|  | Motion of an object |  |
|  | can be plotted on a |  |
|  | distance – time  The slope of a line on a distance – time graph gives the speed of an object in motion. |  |
|  | graph. |  |
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|  |  |  |
|  | X axis -> TIME  X |  |
|  | Y axis -> DISTANCE  TIME |  |
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|  | Question: What is the difference between positive and negative acceleration?  ACCELERATION |  |
|  | Velocity – |  |
|  |  |  |
|  |  |  |
|  | Q: What is the difference between speed & velocity? |  |
|  |  |  |
|  |  |  |
|  | Acceleration – |  |
|  |  |  |
|  |  |  |
|  | CALCULATING ACCELERATION |  |
|  |  |  |
|  |  |  |
|  | Acceleration (m/s²) = |  |
|  |  |  |
|  |  |  |
|  | \* NOTE : |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  | Acceleration formula: |  |
|  |  |  |
|  | NEGATIVE ACCELERATION  POSITIVE ACCELERATION |  |
|  | POSITIVE ACCELERATION  NEGATIVE ACCELERATION |  |
|  |  |  |
|  |  |  |
|  | A plane takes off… A bike comes to a stop… |  |
|  | a = Vf – Vi = 80m/s – Om/s a = Vf – Vi = 0m/s – 3m/s |  |
|  | t 20s t 2s |  |
|  | a = 4m/s² a = -1.5m/s |  |
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|  | Question: What does the force of friction between two objects in contact depend on?  MOTION AND FORCES | | |  |
|  |  | | |  |
|  | Force — | | |  |
|  |  | | |  |
|  | Net Force – | | |  |
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|  | FORCES ARE = FORCES COMBINED FORCES | | |  |
|  | BALANCED FORCES UNBALANCED NET FORCE = TWO | | |  |
|  | NET FORCE = 0 NET FORCE = + FORCES ADDED | | |  |
|  | TOGETHER | | |  |
|  | Friction – | | |  |
|  |  | | |  |
|  |  | | |  |
|  | Friction is caused by microscopic bumps on surfaces called | | |  |
|  |  | | |  |
|  |  | | |  |
|  | TYPE OF FRICTION | DESCRIPTION | EXAMPLE |  |
|  |  |  |  |  |
|  | STATIC |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  | SLIDING | Friction where two |  |  |
|  |  | surfaces slide past |  |  |
|  |  | one another. |  |  |
|  |  | | |  |
|  |  | | |  |
|  | ROLLING | Friction between a |  |  |
|  |  | rolling object and |  |  |
|  |  | surface it rolls on. |  |  |
|  |  |  |  |  |
|  | FLUID |  |  |  |
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|  | Air Resistance – | | |  |
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|  | Question: Newton established his three laws of motion to do what?  NEWTON’S LAWS OF MOTION |  |
|  | ALSO KNOWN AS LAW OF INERTIA! |  |
|  | Newton’s First Law of Motion |  |
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|  |  |  |
|  | Inertia – |  |
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|  |  |  |
|  | WILL CONTINUE IN MOTION UNTIL THESE FORCES ACT ON IT |  |
| WILL STAY AT REST UNTIL FORCE ACTS IN IT |  |  |
|  |  |  |
|  | GRAVITY |  |
|  |  |  |
|  | FRICTION |  |
|  | WALL |  |
|  | WALL |  |
|  | WALL |  |
|  | Newton’s Second Law of Motion |  |
|  |  |  |
|  |  |  |
|  | (Kg \* m/s²) (kg) (m/s²) |  |
|  |  |  |
|  | Force = mass x acceleration  (Kg \* m/s²) (kg) (m/s²) |  |
|  |  |  |
|  | F = m x a |  |
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|  | Newton’s Third Law of Motion |  |
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|  | Momentum – property of  ACTION REACTION |  |
|  | moving object resulting |  |
|  | from its mass and velocity. |  |
|  |  |  |
|  |  |  |
|  | Momentum (p) = mass x velocity |  |
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|  | Question: What causes the path of a projectile to be curved?  GRAVITY |  |
|  |  |  |
|  | Gravity – |  |
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|  |  |  |
|  |  |  |
|  | Weight – |  |
|  |  |  |
|  |  |  |
|  | The greater the object mass, the stronger the gravitational |  |
|  | force on it |  |
|  |  |  |
|  | PROJECTILE MOTION |  |
|  |  |  |
|  | Projectile – |  |
|  | A projectile follows a curved path and has: |  |
|  | V  E  R  T  I  C  A  L |  |
|  | and  M  O  T  I  O  N |  |
|  | HORIZONTAL MOTION |  |
|  | Motion parallel to Earth’s  Motion perpendicular to Earth’s Surface  V  E  R  T  I  C  A  L |  |
|  | surface |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  | CENTRIPETAL FORCE |  |
|  | Centripetal acceleration – |  |
|  |  |  |
|  | “centripetal” means toward the center |  |
|  | Centripetal force – |  |
|  |  |  |
|  |  |  |