

Science Teaching and Learning
Concept Analysis - Force and Motion
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No	Concept	Description	Group of Concept	Concept Position			Example
				Supraordinate Concept	Ordinate Concept	Subordinate Concept	
1.	Motion	when there is a change in position	Concepts with critical attributes which are not perceptible	-	-	• Linear Motion • Force • Newton's Law	• Human Movement • Animal Movement • Plant Movement
2.	Linear Motion	the object moves in straight line	Concepts with critical attributes which are not perceptible	Motion	• Force • Newton's Law	• Uniform Linear Motion • Accelerated Linear Motion	• When the car moves • When the ball kicked
3.	Uniform Linear Motion	the motion which has stable velocity	Concepts with critical attributes which are not perceptible	Linear Motion	Accelerated Linear Motion	• Speed • Displacement • Time	• The athlete runs in competition • Speed is changes when the bus moves
4.	Speed	how fast an object is moving	Concepts involving symbolic representation	Uniform Linear Motion	• Displacement • Time	-	-

5.	Displacement	how far an object is moving	Concepts involving symbolic representation	Uniform Linear Motion	• Speed • Time	-	-
6.	Time	how long an object is moving	Concepts involving symbolic representation	Uniform Linear Motion	• Speed • Displacement	-	-
7.	Accelerated Linear Motion	the motion which has stable acceleration	Concepts with critical attributes which are not perceptible	Linear Motion	Uniform Linear Motion	• Acceleration • Velocity • Time	• Acceleration changes because the car in a way down • The ball falls down vertically
8.	Acceleration	the act or process of moving faster or happening more quickly	Concepts involving symbolic representation	Accelerated Linear Motion	• Velocity • Time	-	-
9.	Velocity	the vector of how fast an object moving	Concepts involving symbolic representation	Accelerated Linear Motion	• Acceleration • Time	-	-
10.	Time	how long an object is moving	Concepts involving symbolic representation	Accelerated Linear Motion	• Acceleration • Velocity	-	-

11.	Forces	attraction or impulse that influences the object.	Concepts with critical attributes which are not perceptible	Motion	• Linear Motion • Newton's Law	• Contact Force • Non-Contact Force	-
12.	Contact Force	the force that physically contacts the object	Concepts with critical attributes which are not perceptible	Forces	Non-Contact Force	• Muscle Force • Friction Force	-
13.	Muscle Force	the force that is inflicted by the muscle	Concepts with critical attributes which are not perceptible	Contact Force	Friction Force	-	• A man pushes the table to make it move • The athlete pulls arrowhead when about to shoot
14.	Friction Force	there are two objects rub against each other	Concepts with critical attributes which are not perceptible	Contact Force	Muscle Force	-	• When the table rubs against the floor • When the motorcycle brakes, the tires rub against the road

15.	Non-Contact Force	the force that doesn't physically contact the object	Concepts with critical attributes which are not perceptible	Forces	Contact Force	• Magnetic Force • Gravity Force	
16.	Magnetic Force	the force that is caused by magnet	Concepts with critical attributes which are not perceptible	Non-Contact Force	Gravity Force	-	When the iron nails are attracted and attach to the magnetic rod
17.	Gravity Force	the force that makes the object always fall down	Concepts with critical attributes which are not perceptible	Non-Contact Force	Magnetic Force	-	• People who are skydiving • Apple falls down from the tree
18.	Newton's Law	three physical laws of relation between force and motion	Concepts which require knowledge of principles	Motion	• Linear Motion • Force	• Newton's First Law • Newton's Second Law • Newton's Third Law	-
19.	Newton's First Law	when the object doesn't undergo any forces, the object will stay at rest	Concepts which require knowledge of principles	Newton's Law	• Newton's Second Law • Newton's Third Law	-	when a coin on paper placed on the table will remain at rest if the paper is pulled quickly
20.	Newton's Second Law	the acceleration	Concepts which require	Newton's Law	• Newton's First Law	• Mass • Acceleration	moving light table will be faster than

		of an object directly proportional to the force acting on it	knowledge of principles		Newton's Third Law		moving heavy cabinets if we use the same force
21.	Mass	how heavy an object		Newton's Second Law	Acceleration	-	-
22.	Acceleration	the act or process of moving faster or happening more quickly		Newton's Second Law	Mass	-	-
23.	Newton's Third Law	the action and reaction forces that occur an object will have the same magnitude	Concepts which require knowledge of principles	Newton's Law	- Newton's First Law - Newton's Second Law	-	- flying bird's motion - movement in swimming activity

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Topic: Motion and Force

