Item	Key Idea	Major Understanding	Item	Difficulty	Item	1	2	3	4	NR
42-MC	5.5.1-Patterns of Motion	5.1r Momentum is conserved in a closed system.	42-MC	0.93	42-MC	18	**2963**	90	99	3
23-MC	4.4.3-Wavelength and Freq.	4.3c The model of a wave incorporates the characteristics of amplitude, wavelength...	23-MC	0.93	23-MC	49	87	**2960**	7	70
07-MC	5.5.1-Patterns of Motion	5.1m The elongation or compression of a spring depends upon the nature of the spring...	07-MC	0.92	07-MC	61	**2919**	87	37	69
16-MC	4.4.1-Trans. of Energy	4.1l All materials display a range of conductivity. At constant temperature...	16-MC	0.89	16-MC	251	**2830**	33	59	0
11-MC	4.4.1-Trans. of Energy	4.1d Kinetic energy is the energy an object possesses by virtue of its motion.	11-MC	0.88	11-MC	142	60	105	**2797**	69
46-MC	5.5.3-Energy Relationships	5.3d The energy of a photon is proportional to its frequency.	46-MC	0.84	46-MC	**2676**	127	227	70	73
34-MC	5.5.3-Energy Relationships	5.3e On the atomic level, energy and matter exhibit the characteristics of both waves and particles.	34-MC	0.83	34-MC	65	387	**2639**	14	68
18-MC	4.4.1-Trans. of Energy	4.1n A circuit has a closed path in which current can exist.	18-MC	0.82	18-MC	109	90	364	**2610**	0
31-MC	4.4.3-Wavelength and Freq.	4.3n When a wave source and an observer are in relative motion, the observed frequency...	31-MC	0.81	31-MC	139	88	305	**2573**	68
08-MC	5.5.1-Patterns of Motion	5.1n Centripetal force is the net force which produces centripetal acceleration...	08-MC	0.80	08-MC	174	186	208	**2536**	69
21-MC	4.4.3-Wavelength and Freq.	4.3j The absolute index of refraction is inversely proportional to the speed of a wave.	21-MC	0.78	21-MC	0	355	346	0	0
14-MC	5.5.1-Patterns of Motion	5.1u The inverse square law applies to electrical and gravitational fields...	14-MC	0.78	14-MC	157	358	**2468**	121	69
44-MC	4.4.1-Trans. of Energy	4.1i Power is the time-rate at which work is done or energy is expended.	44-MC	0.77	44-MC	**2450**	222	292	137	72
28-MC	4.4.3-Wavelength and Freq.	4.3f Resonance occurs when energy is transferred to a system at its natural frequency.	28-MC	0.75	28-MC	274	82	**2372**	376	69
17-MC	4.4.1-Trans. of Energy	4.1m The factors affecting resistance in a conductor are length, cross-sectional area,...	17-MC	0.73	17-MC	505	197	142	**2349**	0
22-MC	4.4.3-Wavelength and Freq.	4.3c The model of a wave incorporates the characteristics of amplitude, wavelength...	22-MC	0.73	22-MC	25	89	**2327**	664	68
15-MC	4.4.1-Trans. of Energy	4.1k Moving electric charges produce magnetic fields. The relative motion between...	15-MC	0.73	15-MC	**2313**	29	270	560	1
37-MC	5.5.1-Patterns of Motion	5.1l According to Newton's First Law, the inertia of an object is directly proportional...	37-MC	0.73	37-MC	**2311**	424	321	45	72
24-MC	4.4.3-Wavelength and Freq.	4.3c The model of a wave incorporates the characteristics of amplitude, wavelength...	24-MC	0.70	24-MC	**2216**	501	104	280	72
40-MC	5.5.1-Patterns of Motion	5.1c The resultant of two or more vectors, acting at any angle, is determined by vector addition.	40-MC	0.70	40-MC	770	53	**2207**	70	73
25-MC	4.4.3-Wavelength and Freq.	4.3c The model of a wave incorporates the characteristics of amplitude, wavelength...	25-MC	0.69	25-MC	91	**2204**	552	255	71
36-MC	1.Standard 6	I3.2 Extend their use of powers of ten notation to understanding the exponential...	36-MC	0.68	36-MC	688	**2168**	211	35	71
43-MC	4.4.1-Trans. of Energy	4.1c Potential energy is the energy an object possesses by virtue of its position or condition...	43-MC	0.68	43-MC	130	364	443	**2163**	73
29-MC	4.4.3-Wavelength and Freq.	4.3l Diffraction occurs when waves pass by obstacles or through openings...	29-MC	0.68	29-MC	**948**	43	37	868	68
06-MC	5.5.1-Patterns of Motion	5.1c The resultant of two or more vectors, acting at any angle, is determined by vector addition.	06-MC	0.66	06-MC	30	**2101**	454	519	69
13-MC	4.4.1-Trans. of Energy	4.1r Power is the time-rate at which work is done or energy is expended.	13-MC	0.66	13-MC	918	**2091**	51	45	68
38-MC	5.5.1-Patterns of Motion	5.1c The resultant of two or more vectors, acting at any angle, is determined by vector addition.	38-MC	0.66	38-MC	386	**2085**	252	377	73
12-MC	4.4.1-Trans. of Energy	4.1e In an ideal mechanical system, the sum of the macroscopic kinetic and potential energies...	12-MC	0.65	12-MC	259	501	**2056**	346	11
45-MC	5.5.3-Energy Relationships	5.3g The Standard Model of Particle Physics has evolved...	45-MC	0.64	45-MC	420	294	**2037**	350	72
19-MC	4.4.1-Trans. of Energy	4.1l All materials display a range of conductivity. At constant temperature...	19-MC	0.63	19-MC	**1993**	306	570	231	73
26-MC	4.4.3-Wavelength and Freq.	4.3g Electromagnetic radiation exhibits wave characteristics...	26-MC	0.62	26-MC	245	225	735	**1968**	0
27-MC	4.4.3-Wavelength and Freq.	4.3d Mechanical waves require a material medium through which to travel.	27-MC	0.61	27-MC	805	201	**1927**	171	69
04-MC	5.5.1-Patterns of Motion	5.1n Centripetal force is the net force which produces centripetal acceleration...	04-MC	0.60	04-MC	1105	47	59	**1894**	68
01-MC	5.5.1-Patterns of Motion	5.1a Measured quantities can be classified as either vector or scalar.	01-MC	0.57	01-MC	**1795**	493	310	505	70
02-MC	4.4.1-Trans. of Energy	4.1p Electrical power and energy can be determined for electric circuits...	02-MC	0.54	02-MC	**1639**	1288	69	177	0
20-MC	4.4.1-Trans. of Energy	4.1e An object in free fall accelerates due to the force of gravity...	20-MC	0.52	20-MC	493	265	**1707**	636	72
32-MC	5.5.3-Energy Relationships	5.1e An object in free fall accelerates due to the force of gravity...	32-MC	0.51	32-MC	372	**1608**	547	577	69
30-MC	5.5.3-Energy Relationships	5.3b Charge is quantized on two levels. On the atomic level...	30-MC	0.49	30-MC	**1539**	542	955	42	68
05-MC	4.4.3-Wavelength and Freq.	4.3m When waves of a similar nature meet, the resulting interference may be explained...	05-MC	0.47	05-MC	1290	0	374	0	2
09-MC	5.5.1-Patterns of Motion	5.1r Momentum is conserved in a closed system.	09-MC	0.45	09-MC	1006	162	**1419**	515	71
33-MC	5.5.3-Energy Relationships	5.3b Charge is quantized on two levels. On the atomic level...	33-MC	0.42	33-MC	**1325**	1059	198	522	69
35-MC	5.5.3-Energy Relationships	5.3 The fundamental source of all energy in the universe is the conversion of mass into energy.	35-MC	0.41	35-MC	**1287**	133	473	1210	70
03-MC	5.5.1-Patterns of Motion	5.1l Weight is the gravitational force with which a planet attracts a mass.	03-MC	0.38	03-MC	153	**1220**	473	1597	74
41-MC	5.5.1-Patterns of Motion	5.1g A projectile's time of flight is dependent upon the vertical component of its motion.	41-MC	0.37	41-MC	201	**1149**	129	588	73
39-MC	5.5.1-Patterns of Motion	5.1c The resultant of two or more vectors, acting at any angle, is determined by vector addition.	39-MC	0.34	39-MC	277	1369	1089	**1162**	72
10-MC	5.5.1-Patterns of Motion	5.1q According to Newton's Third Law, forces occur in action/reaction pairs...	10-MC	0.34	10-MC	**1072**	1718	66	317	0

Item	Key Idea	Major Understanding	Item	Difficulty	0	1	2	NR
56-CR	5. 5.1-Patterns of Motion	5.1g A projectile's time of flight is dependent upon the vertical component of its motion.	56-CR	0.97	99	3074	0	0
49-CR	4. 4.3-Wavelength and Freq.	4.3c The model of a wave incorporates the characteristics of amplitude, wavelength...	49-CR	0.97	109	3064	0	0
50-CR	4. 4.3-Wavelength and Freq.	4.3c The model of a wave incorporates the characteristics of amplitude, wavelength...	50-CR	0.96	125	3048	0	0
55-CR	5. 5.1-Patterns of Motion	5.1f The path of a projectile is the result of the simultaneous effect of the horizontal and...	55-CR	0.96	138	3035	0	0
51-CR	4. 4.3-Wavelength and Freq.	4.3c The model of a wave incorporates the characteristics of amplitude, wavelength...	51-CR	0.87	416	2757	0	0
72-CR	5. 5.3-Energy Relationships	5.3d The energy of a photon is proportional to its frequency.	72-CR	0.85	295	338	2540	0
69-CR	4. 4.3-Wavelength and Freq.	4.3i When a wave moves from one medium into another, the wave may refract due...	69-CR	0.82	420	299	2454	0
70-CR	4. 4.3-Wavelength and Freq.	4.3i When a wave moves from one medium into another, the wave may refract due...	70-CR	0.81	590	2583	0	0
68-CR	4. 4.3-Wavelength and Freq.	4.3i When a wave moves from one medium into another, the wave may refract due...	68-CR	0.80	630	2543	0	0
59-CR	5. 5.1-Patterns of Motion	5.1s Field strength and direction are determined using a suitable test particle...	59-CR	0.80	471	332	2370	0
65-CR	5. 5.1-Patterns of Motion	5.1l According to Newton's First Law, the inertia of an object is directly proportional...	65-CR	0.80	403	466	2236	68
66-CR	4. 4.1-Trans. of Energy	4.1c Potential energy is the energy an object possesses by virtue of its position or condition...	66-CR	0.79	178	968	2027	0
67-CR	4. 4.1-Trans. of Energy	4.1c Potential energy is the energy an object possesses by virtue of its position or condition...	67-CR	0.78	452	462	2259	0
64-CR	5. 5.1-Patterns of Motion	5.1i According to Newton's First Law, the inertia of an object is directly proportional...	64-CR	0.76	759	2414	0	0
52-CR	5. 5.1-Patterns of Motion	5.1b A vector may be resolved into perpendicular components.	52-CR	0.75	542	514	2117	0
71-CR	4. 4.3-Wavelength and Freq.	4.3i When a wave moves from one medium into another, the wave may refract due...	71-CR	0.75	806	2367	0	0
73-CR	M. Standard 1	M1.1 Use algebraic and geometric representations to describe and compare data.	73-CR	0.73	869	2304	0	0
62-CR	5. 5.1-Patterns of Motion	5.1o Kinetic friction is a force that opposes motion.	62-CR	0.72	366	1023	1784	0
54-CR	4. 4.1-Trans. of Energy	4.1e In an ideal mechanical system, the sum of the macroscopic kinetic and potential energies...	54-CR	0.62	277	1834	1062	0
60-CR	5. 5.3-Energy Relationships	5.3j The fundamental source of all energy in the universe is the conversion of mass into energy.	60-CR	0.61	737	1005	1431	0
48-CR	5. 5.1-Patterns of Motion	5.1s Field strength and direction are determined using a suitable test particle...	48-CR	0.59	934	731	1508	0
47-CR	5. 5.1-Patterns of Motion	5.1s Field strength and direction are determined using a suitable test particle...	47-CR	0.58	1330	1843	0	0
61-CR	5. 5.1-Patterns of Motion	5.1q According to Newton's Third Law, forces occur in action/reaction pairs...	61-CR	0.49	1609	1564	0	0
58-CR	4. 4.1-Trans. of Energy	4.1o Circuit components may be connected in series or in parallel...	58-CR	0.49	1614	1559	0	0
57-CR	5. 5.1-Patterns of Motion	5.1h The horizontal displacement of a projectile is dependent upon...	57-CR	0.49	1628	1545	0	0
74-CR	5. 5.3-Energy Relationships	5.3a States of matter and energy are restricted to discrete values (quantized).	74-CR	0.48	1663	1510	0	0
63-CR	5. 5.1-Patterns of Motion	5.1c The resultant of two or more vectors, acting at any angle, is determined by vector addition.	63-CR	0.47	1690	1483	0	0
53-CR	5. 5.1-Patterns of Motion	5.1o Kinetic friction is a force that opposes motion.	53-CR	0.37	1995	178	0	0