

Pl\_01 (PA13011): Wave Phenom. & Atomic/Nuclear / Knowing Type: MC Key: B  
Label: Fraunhofer lines

COUNTRY	N	DIFF %	A %	B %	C %	D %	E %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	76.4	9.0	76.4	3.2	2.5	6.1	2.4	0.3	77.3	75.7
Italy	1150	42.1	16.8	42.1	11.4	7.2	9.7	12.3	0.5	43.8	40.5
Lebanon	386	47.1	18.5	47.1	9.0	4.7	8.6	11.2	0.9	49.0	46.0
Norway	831	87.3	1.3	87.3	6.5	1.3	2.4	1.0	0.1	89.0	86.6
Portugal	577	63.6	3.9	63.6	21.4	5.7	3.8	1.6	0.0	66.8	62.6
Russian Federation	1270	43.5	28.7	43.5	11.6	6.2	7.6	2.2	0.2	47.0	40.9
Slovenia	375	60.1	14.3	60.1	9.9	8.5	5.5	1.6	0.0	67.9	56.8
Sweden	1234	44.5	13.6	44.5	15.4	8.2	15.3	2.6	0.4	48.1	41.9
United States	977	41.1	18.6	41.1	14.8	9.7	13.2	2.6	0.0	46.3	38.0
International Avg (n=9)	8132	56.2	13.9	56.2	11.5	6.0	8.0	4.2	0.3	59.5	54.3

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

Pl\_02 (PA13012): Mechanics & Thermodynamics / Applying      Type: MC      Key: C  
Label: Force on connected springs

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	10.1	50.2	1.3	10.1	36.0	2.1	0.3	8.8	11.2
Italy	1150	9.1	51.4	2.7	9.1	31.1	5.2	0.5	6.4	11.5
Lebanon	386	12.9	50.9	2.6	12.9	27.4	5.0	1.1	12.8	12.9
Norway	831	33.7	35.6	1.3	33.7	28.4	0.9	0.1	23.3	37.9
Portugal	577	10.0	53.5	0.8	10.0	34.1	1.6	0.0	6.5	11.0
Russian Federation	1270	35.2	34.1	0.9	35.2	28.9	0.7	0.2	35.9	34.7
Slovenia	375	34.6	37.9	0.5	34.6	26.3	0.8	0.0	30.1	36.4
Sweden	1234	20.3	38.4	1.2	20.3	37.1	2.6	0.5	16.6	22.9
United States	977	23.2	44.6	1.4	23.2	30.3	0.3	0.2	17.6	26.5
International Avg (n=9)	8132	21.0	44.1	1.4	21.0	31.1	2.1	0.3	17.6	22.8

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

Pl\_03 (PA13013): Wave Phenom. & Atomic/Nuclear / Reasoning Type: MC Key: C  
Label: Rutherford experiment

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	30.3	5.3	13.3	30.3	47.0	3.8	0.3	28.6	31.7
Italy	1150	34.5	10.3	12.5	34.5	27.2	15.0	0.5	29.9	38.5
Lebanon	385	22.7	12.8	20.0	22.7	25.5	17.2	1.8	23.1	22.4
Norway	831	39.6	6.2	11.7	39.6	39.1	3.3	0.1	35.7	41.2
Portugal	577	28.5	7.8	15.3	28.5	41.9	6.4	0.0	29.2	28.3
Russian Federation	1270	49.2	7.6	15.4	49.2	26.4	1.2	0.2	46.8	51.0
Slovenia	375	30.8	9.6	22.0	30.8	35.2	2.4	0.0	33.8	29.6
Sweden	1234	32.4	9.5	15.0	32.4	40.1	2.3	0.6	28.6	35.3
United States	977	40.0	8.2	11.4	40.0	38.8	1.4	0.2	36.7	42.0
International Avg (n=9)	8131	34.2	8.6	15.2	34.2	35.7	5.9	0.4	32.5	35.6

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

Pl\_04 (PA13014): Mechanics & Thermodynamics / Reasoning Type: MC Key: B  
Label: Speed of aircraft

COUNTRY	N	DIFF %	A %	B %	C %	D %	E %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	27.6	16.5	27.6	9.8	32.9	8.3	4.5	0.3	26.8	28.4
Italy	1150	39.3	17.9	39.3	8.8	15.0	9.7	8.6	0.6	40.3	38.4
Lebanon	385	33.5	18.8	33.5	10.6	14.0	11.7	9.5	1.8	34.4	33.1
Norway	831	67.8	4.7	67.8	3.1	12.3	10.3	1.5	0.3	72.9	65.7
Portugal	577	54.9	3.3	54.9	3.7	26.2	10.4	1.2	0.4	53.3	55.4
Russian Federation	1270	74.5	8.2	74.5	4.4	6.0	5.5	1.0	0.3	74.3	74.6
Slovenia	375	59.1	9.4	59.1	7.2	15.2	8.8	0.3	0.0	51.5	62.2
Sweden	1234	38.1	14.8	38.1	9.6	16.1	17.7	3.1	0.6	40.4	36.4
United States	977	42.5	12.1	42.5	11.3	19.5	13.4	0.9	0.2	37.4	45.7
International Avg (n=9)	8131	48.6	11.8	48.6	7.6	17.5	10.6	3.4	0.5	47.9	48.9

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

Pl\_05 (PA13015): Mechanics & Thermodynamics / Knowing Type: MC Key: C  
Label: Heat transfer

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	81.6	1.4	1.1	81.6	15.3	0.2	0.4	77.1	85.3
Italy	1150	71.0	2.3	1.5	71.0	22.0	2.6	0.6	65.6	75.6
Lebanon	386	51.9	1.2	1.2	51.9	35.5	8.4	1.8	42.8	57.2
Norway	831	67.6	0.6	2.7	67.6	27.0	1.8	0.3	62.7	69.5
Portugal	577	88.4	0.4	1.2	88.4	9.0	0.6	0.4	86.4	89.0
Russian Federation	1270	83.6	0.6	0.8	83.6	14.7	0.1	0.3	82.6	84.4
Slovenia	375	62.8	1.8	2.5	62.8	32.7	0.2	0.0	49.7	68.3
Sweden	1234	81.5	0.6	0.8	81.5	13.3	3.0	0.8	81.2	81.7
United States	977	53.2	1.4	5.2	53.2	39.8	0.2	0.2	48.4	56.2
International Avg (n=9)	8132	71.3	1.1	1.9	71.3	23.3	1.9	0.5	66.3	74.1

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

Pl\_06 (PA13016): Electricity & Magnetism / Applying Type: MC Key: D  
Label: Direction of magnetic force on wire

COUNTRY	N	DIFF %	A %	B %	C %	D %	E %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	7.7	19.5	17.9	10.2	7.7	33.3	11.0	0.4	8.5	7.1
Italy	1150	19.1	14.6	14.1	25.1	19.1	16.1	10.5	0.6	16.2	21.6
Lebanon	386	18.4	15.3	16.5	23.5	18.4	14.7	9.8	1.8	14.5	20.6
Norway	831	31.2	12.1	18.9	27.5	31.2	8.2	1.8	0.3	31.7	31.0
Portugal	577	12.9	19.2	26.3	17.9	12.9	18.5	4.8	0.4	10.3	13.6
Russian Federation	1270	51.0	8.2	14.9	16.5	51.0	7.4	1.8	0.3	49.6	52.0
Slovenia	375	27.5	15.0	17.8	27.9	27.5	11.2	0.6	0.0	30.1	26.5
Sweden	1234	20.0	16.1	18.3	27.1	20.0	15.3	2.4	0.8	17.9	21.6
United States	977	14.6	21.7	14.3	26.1	14.6	21.9	1.2	0.2	12.9	15.6
International Avg (n=9)	8132	22.5	15.8	17.7	22.4	22.5	16.3	4.9	0.5	21.3	23.3

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

Pl\_07 (PA13017): Wave Phenom. & Atomic/Nuclear / Reasoning Type: MC Key: D  
Label: Photoelectric effect

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1331	47.3	24.5	9.4	13.5	47.3	4.9	0.4	48.0	46.6
Italy	1150	48.7	11.8	9.4	16.8	48.7	12.5	0.8	49.8	47.8
Lebanon	386	44.2	22.2	15.3	12.7	44.2	3.7	2.0	47.6	42.2
Norway	831	55.8	13.0	14.8	13.5	55.8	2.6	0.3	59.7	54.3
Portugal	577	48.2	18.1	7.8	23.9	48.2	1.6	0.5	44.7	49.2
Russian Federation	1270	67.0	11.7	11.8	7.7	67.0	1.4	0.3	69.6	65.2
Slovenia	375	68.1	17.7	4.5	8.4	68.1	1.2	0.0	74.6	65.4
Sweden	1234	64.1	9.6	9.2	12.3	64.1	3.8	1.0	63.2	64.8
United States	977	58.7	14.6	9.7	14.9	58.7	1.9	0.3	58.9	58.5
International Avg (n=9)	8131	55.8	15.9	10.2	13.7	55.8	3.7	0.6	57.3	54.9

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

Pl\_08 (PA13018): Electricity & Magnetism / Reasoning Type: MC Key: C  
Label: Bulbs using least power

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	28.5	32.9	7.1	28.5	28.4	2.7	0.4	25.2	31.2
Italy	1150	36.3	28.5	9.4	36.3	19.0	6.0	0.9	34.1	38.2
Lebanon	386	50.1	17.3	12.4	50.1	14.4	3.9	2.0	52.5	48.7
Norway	831	50.3	27.6	7.2	50.3	13.1	1.3	0.5	48.7	50.9
Portugal	577	36.0	36.8	14.0	36.0	11.7	0.9	0.6	34.9	36.4
Russian Federation	1270	41.0	28.6	9.6	41.0	19.2	1.0	0.6	38.4	42.8
Slovenia	375	58.8	16.1	12.2	58.8	12.3	0.6	0.0	55.8	60.1
Sweden	1234	51.4	21.7	16.1	51.4	6.1	3.7	1.0	49.1	53.0
United States	977	43.2	30.5	8.8	43.2	16.8	0.4	0.3	44.1	42.6
International Avg (n=9)	8132	43.9	26.7	10.7	43.9	15.7	2.3	0.7	42.5	44.9

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.



Pl\_09 (PA13019): Wave Phenom. & Atomic/Nuclear / Applying Type: MC Key: B  
Label: Nuclear change in an atom

COUNTRY	N	DIFF %	A %	B %	C %	D %	E %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	19.0	17.6	19.0	12.2	14.9	30.7	5.1	0.4	19.4	18.7
Italy	1150	12.7	9.6	12.7	14.0	18.8	24.1	19.7	1.1	13.3	12.3
Lebanon	386	57.1	7.5	57.1	7.8	8.7	7.6	9.4	2.0	57.0	57.2
Norway	831	24.0	15.0	24.0	8.5	26.6	21.1	4.3	0.5	17.5	26.7
Portugal	577	14.3	9.4	14.3	13.9	24.7	30.8	6.2	0.7	16.1	13.7
Russian Federation	1270	73.1	7.1	73.1	4.1	5.7	8.0	1.3	0.8	68.4	76.4
Slovenia	375	41.1	18.2	41.1	7.2	16.4	16.0	1.2	0.0	39.8	41.6
Sweden	1234	22.3	23.3	22.3	12.2	18.3	19.9	3.0	1.0	21.1	23.2
United States	977	25.5	20.0	25.5	9.0	19.5	23.4	2.2	0.3	26.5	24.9
International Avg (n=9)	8132	32.1	14.2	32.1	9.9	17.1	20.2	5.8	0.8	31.0	32.7

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P2\_01A (PA33061A): Mechanics & Thermodynamics / Knowing Type: MC Key: D  
Label: Acceleration of vertically thrown ball

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	9.4	78.2	5.2	6.3	9.4	0.8	0.0	9.5	9.3
Italy	1150	8.9	70.7	7.6	8.2	8.9	4.5	0.1	6.8	10.8
Lebanon	386	19.4	64.9	4.1	9.8	19.4	1.8	0.0	19.6	19.3
Norway	831	56.4	39.1	2.0	2.1	56.4	0.4	0.0	39.9	63.1
Portugal	577	45.5	50.3	2.2	1.7	45.5	0.2	0.0	34.2	48.9
Russian Federation	1270	45.3	47.6	2.8	3.5	45.3	0.8	0.0	40.7	48.6
Slovenia	375	48.3	43.5	2.5	4.4	48.3	1.3	0.0	37.2	52.9
Sweden	1234	24.6	68.8	2.3	3.9	24.6	0.3	0.0	14.9	31.8
United States	977	51.2	40.9	3.0	3.5	51.2	1.4	0.0	35.4	60.7
International Avg (n=9)	8132	34.3	56.0	3.5	4.8	34.3	1.3	0.0	26.5	38.4

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P2\_01B (PA33061B): Mechanics & Thermodynamics / Knowing Type: CR 1 Point  
Label: Time duration of vertically thrown ball

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1331	30.2	46.6	23.3	0.0	30.2	23.7	35.5
Italy	1143	20.5	28.1	51.4	0.1	20.5	13.6	26.4
Lebanon	385	29.9	51.2	18.9	0.0	29.9	22.9	34.0
Norway	831	62.8	21.7	15.5	0.0	62.8	51.8	67.2
Portugal	577	55.1	28.4	16.5	0.0	55.1	46.6	57.7
Russian Federation	1270	48.6	25.4	26.1	0.0	48.6	39.2	55.3
Slovenia	375	72.1	21.5	6.4	0.0	72.1	67.4	74.0
Sweden	1233	48.8	32.7	18.5	0.0	48.8	41.0	54.4
United States	977	64.0	34.2	1.8	0.0	64.0	55.3	69.3
International Avg (n=9)	8122	48.0	32.2	19.8	0.0	48.0	40.2	52.7

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P2\_02 (PA33004): Mechanics & Thermodynamics / Reasoning Type: CR 1 Point  
Label: Expected temperature of water

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	17.9	79.3	2.8	0.0	17.9	17.3	18.4
Italy	1149	26.0	62.5	11.5	0.1	26.0	22.1	29.3
Lebanon	385	9.1	71.7	19.1	0.0	9.1	9.0	9.1
Norway	831	30.8	67.3	2.0	0.0	30.8	31.1	30.7
Portugal	577	47.4	50.9	1.7	0.0	47.4	41.0	49.3
Russian Federation	1270	28.5	64.5	7.0	0.0	28.5	24.1	31.6
Slovenia	375	58.8	40.9	0.3	0.0	58.8	49.6	62.7
Sweden	1233	32.3	65.5	2.1	0.0	32.3	30.1	34.0
United States	977	31.2	67.9	1.0	0.0	31.2	32.2	30.5
International Avg (n=9)	8129	31.3	63.4	5.3	0.0	31.3	28.5	32.8

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P2\_03 (PA33044): Mechanics & Thermodynamics / Knowing      Type: MC      Key: D  
Label: Path of curved bar through air

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	38.2	13.3	30.0	16.7	38.2	1.8	0.0	36.5	39.6
Italy	1150	39.0	12.3	18.2	28.6	39.0	1.7	0.1	38.2	39.8
Lebanon	385	35.3	10.5	30.5	16.7	35.3	7.0	0.0	31.5	37.4
Norway	831	28.8	12.3	28.6	29.0	28.8	1.3	0.0	24.6	30.4
Portugal	577	42.4	12.0	21.3	23.4	42.4	1.0	0.0	34.1	44.9
Russian Federation	1270	15.2	10.8	29.8	43.5	15.2	0.7	0.0	14.7	15.6
Slovenia	375	30.3	12.3	26.1	31.4	30.3	0.0	0.0	28.8	31.0
Sweden	1234	20.5	15.6	37.0	25.0	20.5	2.0	0.0	17.2	22.9
United States	977	44.9	9.5	23.4	20.8	44.9	1.4	0.0	35.9	50.3
International Avg (n=9)	8131	32.7	12.1	27.2	26.1	32.7	1.9	0.0	29.1	34.6

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P2\_04 (PA33075): Mechanics & Thermodynamics / Applying Type: CR 1 Point  
Label: Energy to heat water

COUNTRY	N	10 %	70 %	71 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	29.1	11.3	9.1	22.9	27.6	0.0	29.1	26.4	31.4
Italy	1149	38.7	2.5	6.8	14.1	37.8	0.2	38.7	35.7	41.3
Lebanon	385	12.2	2.7	3.0	31.7	50.3	0.2	12.2	12.7	11.8
Norway	831	17.0	32.0	1.8	25.8	23.3	0.0	17.0	16.9	17.0
Portugal	577	56.9	5.5	14.8	12.7	10.0	0.0	56.9	56.7	56.9
Russian Federation	1270	67.6	4.9	12.0	6.9	8.6	0.0	67.6	64.2	70.0
Slovenia	375	77.2	0.5	11.5	9.3	1.5	0.0	77.2	75.6	77.8
Sweden	1234	53.1	1.1	8.1	22.4	15.3	0.0	53.1	51.4	54.3
United States	977	25.8	11.7	9.3	37.9	15.3	0.0	25.8	27.7	24.7
International Avg (n=9)	8130	41.9	8.0	8.5	20.4	21.1	0.0	41.9	40.8	42.8

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P2\_05A (PA33102A): Electricity & Magnetism / Applying Type: CR 1 Point  
Label: Forces in electric field (DERIVED)

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	76.0	22.6	1.4	0.0	76.0	73.6	78.1
Italy	1150	65.8	28.4	5.6	0.2	65.8	61.4	69.6
Lebanon	384	40.9	22.2	36.7	0.2	40.9	40.4	41.1
Norway	831	75.5	23.8	0.7	0.0	75.5	65.8	79.4
Portugal	577	76.9	22.8	0.3	0.0	76.9	68.2	79.6
Russian Federation	1270	73.4	23.6	3.0	0.0	73.4	68.8	76.7
Slovenia	375	67.0	32.0	1.0	0.0	67.0	58.3	70.6
Sweden	1234	65.8	33.2	1.0	0.0	65.8	61.7	68.8
United States	977	67.7	31.5	0.7	0.0	67.7	64.9	69.5
International Avg (n=9)	8130	67.7	26.7	5.6	0.0	67.7	62.6	70.4

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P2\_05AA (PA33102AA): Electricity & Magnetism / Applying      Type: MC      Key: B  
Label: Direction of force at Point X

COUNTRY	N	DIFF %	A %	B %	C %	D %	E %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	80.3	3.5	80.3	9.8	3.9	0.5	1.9	0.0	78.7	81.7
Italy	1150	72.5	6.1	72.5	10.0	3.5	1.2	6.4	0.2	68.6	75.9
Lebanon	385	43.7	6.3	43.7	8.7	2.9	1.0	37.2	0.2	42.3	44.5
Norway	831	81.0	4.5	81.0	9.6	2.7	0.6	1.6	0.0	73.2	84.1
Portugal	577	81.7	4.8	81.7	9.6	1.9	1.2	0.9	0.0	75.0	83.7
Russian Federation	1270	77.9	5.7	77.9	9.7	2.4	1.1	3.2	0.0	73.7	80.9
Slovenia	375	72.7	10.4	72.7	11.2	2.1	2.6	1.0	0.0	66.7	75.2
Sweden	1234	74.1	6.5	74.1	10.8	4.6	0.7	3.2	0.0	70.0	77.1
United States	977	75.9	4.7	75.9	12.5	3.2	1.8	1.9	0.0	76.8	75.4
International Avg (n=9)	8131	73.3	5.8	73.3	10.2	3.0	1.2	6.4	0.0	69.4	75.4

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.



P2\_05AB (PA33102AB): Electricity & Magnetism / Applying      Type: MC      Key: C  
Label: Direction of force at Point Y

COUNTRY	N	DIFF %	A %	B %	C %	D %	E %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	81.6	1.8	12.8	81.6	0.6	1.2	2.0	0.0	79.0	83.7
Italy	1150	72.5	4.7	11.7	72.5	1.5	1.5	7.9	0.2	67.8	76.6
Lebanon	385	47.3	1.6	10.6	47.3	1.4	1.4	37.5	0.2	47.0	47.5
Norway	831	80.8	3.4	8.1	80.8	3.4	2.2	2.1	0.0	71.5	84.5
Portugal	577	82.4	1.3	9.6	82.4	0.5	3.7	2.5	0.0	74.5	84.9
Russian Federation	1270	79.3	3.2	8.3	79.3	2.3	2.2	4.7	0.0	75.1	82.3
Slovenia	375	76.6	3.6	8.4	76.6	2.5	4.0	4.9	0.0	67.0	80.7
Sweden	1234	71.1	4.0	9.8	71.1	4.2	4.7	6.2	0.0	67.7	73.6
United States	977	73.8	3.6	10.4	73.8	2.0	3.4	6.7	0.0	73.7	73.9
International Avg (n=9)	8131	73.9	3.0	10.0	73.9	2.0	2.7	8.3	0.0	69.2	76.4

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P2\_05AC (PA33102AC): Electricity & Magnetism / Applying Type: MC Key: E  
Label: Direction of force at Point Z

COUNTRY	N	DIFF %	A %	B %	C %	D %	E %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	93.9	1.0	1.1	0.9	1.1	93.9	2.1	0.0	92.9	94.7
Italy	1150	86.1	1.4	1.3	1.3	2.1	86.1	7.7	0.2	84.0	87.9
Lebanon	384	60.0	0.9	0.8	0.3	1.0	60.0	36.9	0.2	56.7	61.8
Norway	831	93.1	0.6	1.3	0.5	0.3	93.1	4.2	0.0	90.3	94.2
Portugal	577	92.2	0.8	2.7	0.8	1.1	92.2	2.4	0.0	84.4	94.6
Russian Federation	1270	89.4	0.9	3.0	0.9	1.6	89.4	4.3	0.0	87.8	90.5
Slovenia	375	87.3	1.9	3.4	0.8	1.1	87.3	5.4	0.0	83.5	89.0
Sweden	1234	90.4	0.7	3.4	2.0	0.5	90.4	3.1	0.0	88.9	91.6
United States	977	85.0	1.1	2.7	2.4	0.9	85.0	7.9	0.0	81.0	87.5
International Avg (n=9)	8130	86.4	1.0	2.2	1.1	1.1	86.4	8.2	0.0	83.3	88.0

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P2\_05B (PA33102B): Electricity & Magnetism / Applying      Type: CR    1 Point  
Label: Order points by field strength

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	54.2	40.8	5.0	0.0	54.2	52.0	56.0
Italy	1150	34.9	46.2	18.7	0.2	34.9	30.5	38.8
Lebanon	384	50.1	30.6	19.1	0.2	50.1	52.8	48.5
Norway	816	46.9	41.5	11.6	0.0	46.9	49.4	45.9
Portugal	577	69.3	29.8	0.9	0.0	69.3	68.9	69.4
Russian Federation	1270	49.7	38.8	11.4	0.0	49.7	49.8	49.7
Slovenia	375	57.5	39.4	3.1	0.0	57.5	56.0	58.1
Sweden	1234	46.3	49.2	4.5	0.0	46.3	49.2	44.2
United States	977	43.5	53.9	2.6	0.0	43.5	44.9	42.6
International Avg (n=9)	8115	50.3	41.1	8.6	0.0	50.3	50.4	50.4

V1 = Percent scoring 1 pt or better;    V2 = Percent scoring 2 pts;    Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P2\_06 (PA33121): Electricity & Magnetism / Reasoning Type: MC Key: B  
 Label: Heating an iron plate

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	44.9	9.2	44.9	23.4	21.5	1.0	0.0	42.7	46.6
Italy	1150	64.6	6.3	64.6	15.9	11.0	2.0	0.2	63.4	65.7
Lebanon	386	22.5	6.7	22.5	30.1	38.3	2.0	0.4	19.2	24.5
Norway	831	67.3	2.3	67.3	16.0	13.7	0.7	0.0	67.2	67.3
Portugal	577	36.5	8.8	36.5	16.9	36.1	1.7	0.0	34.8	37.0
Russian Federation	1270	63.6	2.1	63.6	19.6	14.2	0.5	0.0	61.2	65.3
Slovenia	375	59.4	1.5	59.4	26.4	12.4	0.2	0.0	56.9	60.5
Sweden	1234	52.6	3.8	52.6	22.0	19.8	1.7	0.0	50.2	54.4
United States	977	38.4	8.4	38.4	38.0	14.4	0.8	0.0	37.8	38.8
International Avg (n=9)	8132	50.0	5.5	50.0	23.1	20.2	1.2	0.1	48.1	51.1

DIFF = Percent correct  
 Because of missing gender information, some totals may appear inconsistent.

P2\_07 (PA33115): Wave Phenom. & Atomic/Nuclear / Knowing Type: MC Key: A  
Label: Nuclear power plant fuel

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	14.3	14.3	63.7	10.5	10.9	0.7	0.0	11.0	16.9
Italy	1150	42.0	42.0	27.9	10.0	12.9	7.0	0.2	36.9	46.4
Lebanon	386	37.0	37.0	27.6	10.2	15.7	9.1	0.4	32.3	39.7
Norway	831	60.4	60.4	19.4	9.5	9.1	1.7	0.0	48.2	65.3
Portugal	577	25.7	25.7	52.7	8.8	11.5	0.9	0.5	24.3	26.1
Russian Federation	1270	54.0	54.0	36.7	6.2	2.3	0.8	0.0	50.5	56.5
Slovenia	375	42.6	42.6	50.1	4.4	2.3	0.5	0.0	36.8	45.1
Sweden	1234	36.5	36.5	43.6	7.7	10.3	1.8	0.1	31.9	39.8
United States	977	28.8	28.8	44.3	12.5	13.3	1.1	0.0	22.1	32.9
International Avg (n=9)	8132	37.9	37.9	40.7	8.9	9.8	2.6	0.1	32.7	41.0

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P2\_08 (PA33005): Wave Phenom. & Atomic/Nuclear / Applying Type: CR 1 Point  
Label: Sound wavelength in air

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	47.1	30.1	22.8	0.0	47.1	46.2	47.9
Italy	1149	42.9	20.3	36.7	0.2	42.9	43.4	42.4
Lebanon	385	58.5	19.4	21.5	0.5	58.5	53.2	61.6
Norway	831	59.1	23.8	17.1	0.0	59.1	62.1	57.9
Portugal	577	72.8	15.6	11.1	0.5	72.8	79.1	70.8
Russian Federation	1270	63.8	17.1	19.1	0.0	63.8	60.5	66.1
Slovenia	375	72.0	20.2	7.9	0.0	72.0	73.1	71.5
Sweden	1233	52.9	27.9	19.1	0.1	52.9	54.4	51.8
United States	977	52.8	35.0	12.2	0.0	52.8	53.2	52.6
International Avg (n=9)	8129	58.0	23.3	18.6	0.1	58.0	58.3	58.1

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P2\_09A (PA33101A): Wave Phenom. & Atomic/Nuclear / Reasoning Type: MC Key: C  
Label: Temperature and frequency intensity

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	47.4	13.9	26.5	47.4	10.3	1.9	0.0	41.2	52.6
Italy	1150	47.4	9.6	27.4	47.4	6.9	8.6	0.2	45.1	49.3
Lebanon	385	33.8	13.9	28.6	33.8	15.1	8.1	0.5	29.4	36.4
Norway	831	67.3	6.4	16.3	67.3	9.5	0.6	0.0	62.8	69.1
Portugal	577	68.8	6.0	18.0	68.8	6.0	0.7	0.5	63.3	70.4
Russian Federation	1270	54.4	7.5	27.6	54.4	8.2	2.3	0.0	50.7	57.0
Slovenia	374	53.6	10.1	25.8	53.6	9.8	0.7	0.0	50.9	54.8
Sweden	1234	54.1	9.8	25.1	54.1	9.6	1.2	0.2	51.2	56.3
United States	977	56.6	5.8	29.3	56.6	7.7	0.6	0.0	57.0	56.3
International Avg (n=9)	8130	53.7	9.2	25.0	53.7	9.2	2.8	0.1	50.2	55.8

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P2\_09B (PA33101B): Wave Phenom. & Atomic/Nuclear / Reasoning Type: CR 1 Point  
Label: Wavelength of max intensity radiation

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1332	8.9	87.7	3.4	0.0	8.9	10.8	7.3
Italy	1150	2.7	76.2	21.0	0.2	2.7	1.3	3.9
Lebanon	384	32.9	52.0	14.5	0.5	32.9	37.1	30.5
Norway	831	6.4	89.5	4.1	0.0	6.4	6.0	6.6
Portugal	577	6.3	90.9	2.4	0.5	6.3	6.0	6.4
Russian Federation	1270	14.1	75.5	10.4	0.0	14.1	14.3	14.0
Slovenia	375	26.0	73.3	0.7	0.0	26.0	31.0	23.9
Sweden	1234	16.1	76.5	7.1	0.2	16.1	18.5	14.4
United States	977	10.5	86.4	3.1	0.0	10.5	9.3	11.3
International Avg (n=9)	8130	13.8	78.7	7.4	0.1	13.8	14.9	13.2

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.



P3\_01 (PA23071): Mechanics & Thermodynamics / Applying      Type: MC      Key: B  
Label: Graph of ball's potential energy

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1302	56.7	22.5	56.7	8.5	12.1	0.2	0.0	55.0	58.2
Italy	1134	50.9	30.7	50.9	6.9	8.6	2.6	0.1	50.5	51.3
Lebanon	379	59.8	33.1	59.8	3.3	2.9	0.9	0.0	53.4	63.5
Norway	820	57.6	32.7	57.6	4.9	4.3	0.5	0.0	42.2	63.8
Portugal	605	60.2	33.5	60.2	4.0	2.1	0.2	0.0	59.9	60.3
Russian Federation	1281	45.3	44.0	45.3	5.8	4.4	0.5	0.0	43.6	46.6
Slovenia	368	63.9	26.9	63.9	4.7	4.5	0.0	0.0	56.1	67.5
Sweden	1237	60.8	18.7	60.8	6.0	13.8	0.6	0.1	53.4	66.0
United States	991	59.8	26.7	59.8	5.7	6.2	1.6	0.0	53.1	64.3
International Avg (n=9)	8117	57.2	29.9	57.2	5.5	6.5	0.8	0.0	51.9	60.2

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P3\_02 (PA23146): Mechanics & Thermodynamics / Knowing Type: CR 1 Point  
Label: Direction of acceleration of body

COUNTRY	N	10 %	70 %	71 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1302	22.0	11.2	0.7	52.5	13.6	0.0	22.0	21.5	22.5
Italy	1133	33.6	16.3	6.4	24.8	18.8	0.1	33.6	32.0	34.9
Lebanon	379	24.4	8.5	0.2	53.5	13.4	0.0	24.4	24.7	24.2
Norway	804	83.3	4.1	0.9	8.9	2.9	0.0	83.3	81.4	84.0
Portugal	605	65.7	9.1	0.7	21.5	3.0	0.0	65.7	68.5	64.6
Russian Federation	1281	81.7	5.4	0.2	8.7	4.0	0.0	81.7	82.2	81.4
Slovenia	366	59.5	14.9	4.5	17.8	3.2	0.0	59.5	70.0	54.6
Sweden	1235	54.6	20.2	6.4	15.2	3.6	0.1	54.6	56.6	53.2
United States	991	55.6	10.7	3.2	27.7	2.8	0.0	55.6	51.1	58.6
International Avg (n=9)	8096	53.4	11.1	2.6	25.6	7.3	0.0	53.4	54.2	53.1

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P3\_03 (PA23029): Mechanics & Thermodynamics / Knowing Type: MC Key: D  
Label: Explain tennis ball rebound height

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1302	18.4	50.0	20.3	11.1	18.4	0.2	0.0	15.3	21.1
Italy	1134	23.0	49.5	17.6	7.7	23.0	2.1	0.1	18.2	27.1
Lebanon	379	33.4	26.3	19.0	16.9	33.4	4.4	0.0	36.0	31.9
Norway	820	58.3	28.3	10.1	2.5	58.3	0.8	0.0	52.1	60.8
Portugal	605	55.2	20.4	11.3	12.1	55.2	1.0	0.0	57.0	54.5
Russian Federation	1281	51.0	28.9	12.7	6.8	51.0	0.6	0.0	51.0	51.0
Slovenia	368	57.8	32.3	5.3	4.1	57.8	0.5	0.0	51.2	60.8
Sweden	1237	44.2	34.3	15.2	4.3	44.2	1.9	0.1	37.5	48.8
United States	991	45.6	37.3	11.7	4.3	45.6	1.1	0.0	35.9	52.0
International Avg (n=9)	8117	43.0	34.2	13.7	7.7	43.0	1.4	0.0	39.4	45.3

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P3\_04 (PA23104): Electricity & Magnetism / Applying Type: MC Key: C  
Label: Direction of electric force

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1302	34.5	42.3	15.1	34.5	7.4	0.5	0.0	34.4	34.6
Italy	1134	48.5	30.8	11.0	48.5	6.5	3.1	0.1	47.2	49.6
Lebanon	379	42.7	22.2	19.6	42.7	11.8	3.7	0.0	48.3	39.4
Norway	820	58.5	26.0	6.8	58.5	8.3	0.3	0.0	52.7	60.9
Portugal	605	55.7	28.2	6.6	55.7	8.9	0.6	0.0	44.0	60.0
Russian Federation	1281	65.0	20.2	7.6	65.0	6.6	0.7	0.0	64.7	65.2
Slovenia	368	58.5	24.4	8.1	58.5	9.0	0.0	0.0	64.6	55.8
Sweden	1237	53.8	20.4	10.6	53.8	13.4	1.7	0.1	51.7	55.3
United States	991	42.5	38.4	9.6	42.5	8.6	0.9	0.0	38.3	45.3
International Avg (n=9)	8117	51.1	28.1	10.6	51.1	8.9	1.3	0.0	49.5	51.8

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P3\_05 (PA23038): Electricity & Magnetism / Applying Type: MC Key: A  
Label: Connections in decreasing resistance

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1302	22.7	22.7	15.2	34.6	23.2	4.4	0.0	16.7	28.0
Italy	1134	31.6	31.6	22.0	22.5	19.1	4.7	0.1	30.0	32.9
Lebanon	379	32.4	32.4	14.3	34.0	17.5	1.8	0.0	33.9	31.5
Norway	820	42.3	42.3	17.4	25.0	13.7	1.7	0.0	42.4	42.2
Portugal	605	31.3	31.3	17.4	25.7	23.0	2.6	0.0	18.9	35.7
Russian Federation	1281	60.2	60.2	19.8	11.6	8.2	0.2	0.0	58.0	61.8
Slovenia	368	61.5	61.5	19.7	10.3	7.7	0.8	0.0	57.6	63.2
Sweden	1237	37.5	37.5	18.3	24.4	17.9	1.9	0.1	34.9	39.3
United States	991	35.8	35.8	18.8	28.4	16.0	1.0	0.0	31.8	38.4
International Avg (n=9)	8117	39.5	39.5	18.1	24.1	16.2	2.1	0.0	36.0	41.5

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P3\_06 (PA23041): Electricity & Magnetism / Knowing Type: CR 1 Point  
 Label: Explain what symbols represent

COUNTRY	N	10 %	70 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1302	5.2	37.0	48.1	9.5	0.1	5.2	5.0	5.4
Italy	1134	66.3	21.3	6.2	6.0	0.2	66.3	67.6	65.1
Lebanon	379	50.8	19.8	17.9	11.5	0.0	50.8	60.0	45.5
Norway	820	74.6	15.5	7.6	2.3	0.0	74.6	75.2	74.4
Portugal	605	33.6	29.2	28.0	9.3	0.0	33.6	37.9	32.0
Russian Federation	1281	71.5	20.8	4.4	3.3	0.0	71.5	74.5	69.3
Slovenia	365	70.6	23.7	4.8	0.8	0.0	70.6	74.2	68.9
Sweden	1236	54.2	23.5	18.0	4.3	0.1	54.2	58.8	51.1
United States	991	25.4	26.7	41.1	6.8	0.0	25.4	19.0	29.7
International Avg (n=9)	8113	50.2	24.2	19.6	6.0	0.0	50.2	52.5	49.0

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
 Because of missing gender information, some totals may appear inconsistent.

P3\_07 (PA23053): Mechanics & Thermodynamics / Applying Type: CR 2 Points  
Label: Gas volume when pressure doubled

COUNTRY	N	20 %	10 %	11 %	70 %	71 %	79 %	OMITTED %	NOT REACHED %	V1 %	V2 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1302	0.8	0.3	7.9	0.2	9.5	41.4	39.6	0.2	8.9	0.8	0.9	0.7
Italy	1132	12.4	3.2	18.7	0.3	15.0	17.9	32.3	0.2	34.3	12.4	9.9	14.5
Lebanon	379	21.4	10.4	10.1	1.0	0.7	16.2	40.1	0.0	41.9	21.4	26.3	18.5
Norway	820	5.7	2.7	10.1	0.0	6.7	27.6	47.2	0.0	18.6	5.7	3.8	6.5
Portugal	605	5.7	1.9	20.5	0.9	8.8	37.9	24.2	0.0	28.2	5.7	2.6	6.8
Russian Federation	1281	41.5	7.9	8.6	0.5	0.4	16.4	24.7	0.0	58.0	41.5	42.5	40.8
Slovenia	367	49.8	11.5	6.2	0.5	1.1	28.3	2.7	0.0	67.5	49.8	41.6	53.6
Sweden	1237	11.6	3.7	14.9	0.0	10.1	32.6	27.1	0.1	30.2	11.6	9.1	13.3
United States	991	11.2	5.9	16.9	0.2	10.6	39.0	16.2	0.0	34.0	11.2	11.7	10.9
International Avg (n=9)	8114	17.8	5.3	12.7	0.4	7.0	28.6	28.2	0.1	35.7	17.8	16.5	18.4

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P3\_08 (PA23148): Mechanics & Thermodynamics / Applying      Type: MC      Key: B  
Label: Why temp decrease when air rises

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1302	56.5	11.5	56.5	13.5	17.1	1.2	0.2	53.6	59.1
Italy	1134	59.4	9.5	59.4	10.3	13.8	6.8	0.2	53.5	64.5
Lebanon	376	46.9	15.9	46.9	16.1	13.3	7.0	0.8	47.7	46.5
Norway	820	81.8	2.8	81.8	8.6	5.7	1.1	0.0	77.4	83.6
Portugal	605	59.0	7.2	59.0	11.2	21.7	0.9	0.0	59.0	59.0
Russian Federation	1281	71.4	13.7	71.4	6.0	8.2	0.7	0.0	70.3	72.2
Slovenia	368	71.5	7.3	71.5	4.4	15.9	1.0	0.0	76.2	69.2
Sweden	1237	66.2	7.6	66.2	14.2	9.4	2.5	0.1	64.7	67.2
United States	991	69.1	5.1	69.1	8.8	15.1	1.9	0.0	65.7	71.4
International Avg (n=9)	8114	64.7	8.9	64.7	10.3	13.4	2.6	0.1	63.1	65.9

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.



P3\_09 (PA23119): Mechanics & Thermodynamics / Reasoning Type: CR 2 Points  
 Label: Why food stays at same temp in Sun

COUNTRY	N	20 %	21 %	10 %	70 %	71 %	79 %	OMITTED %	NOT REACHED %	V1 %	V2 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1302	3.0	1.0	1.2	2.8	6.0	58.0	27.6	0.2	5.3	4.0	1.2	6.6
Italy	1133	2.0	1.0	6.9	1.7	7.9	23.3	57.0	0.2	9.9	3.1	1.8	4.1
Lebanon	379	0.0	0.0	1.0	0.3	0.0	43.0	54.9	0.8	1.0	0.0	0.0	0.0
Norway	820	12.2	3.9	0.3	1.3	2.7	49.0	30.7	0.0	16.3	16.1	11.3	18.0
Portugal	605	17.0	1.1	8.2	1.6	5.4	38.6	28.0	0.1	26.3	18.1	19.1	17.8
Russian Federation	1281	4.2	2.4	13.4	7.8	2.0	31.0	39.2	0.0	20.0	6.5	5.7	7.1
Slovenia	366	21.6	1.3	5.4	8.9	17.5	27.8	17.6	0.0	28.3	22.9	14.5	26.8
Sweden	1235	11.0	1.3	2.7	5.6	6.1	47.1	26.1	0.1	15.0	12.3	7.5	15.6
United States	991	7.9	2.4	5.0	5.8	11.9	53.1	13.9	0.0	15.4	10.4	4.4	14.3
International Avg (n=9)	8112	8.8	1.6	4.9	4.0	6.6	41.2	32.8	0.2	15.3	10.4	7.3	12.3

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
 Because of missing gender information, some totals may appear inconsistent.

P3\_10 (PA23088): Wave Phenom. & Atomic/Nuclear / Knowing Type: CR 1 Point  
Label: Protons and neutrons in isotopes

COUNTRY	N	10 %	70 %	71 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1302	21.5	5.9	2.3	56.9	13.3	0.2	21.5	17.5	25.1
Italy	1126	20.1	6.6	0.8	31.5	40.8	0.3	20.1	19.5	20.6
Lebanon	379	60.7	1.7	1.7	22.6	12.4	1.1	60.7	66.7	57.1
Norway	820	62.5	5.3	1.4	27.2	3.6	0.0	62.5	63.2	62.3
Portugal	605	35.2	6.4	4.4	40.1	13.6	0.2	35.2	36.7	34.7
Russian Federation	1281	71.3	1.8	2.9	16.2	7.6	0.1	71.3	74.2	69.2
Slovenia	367	55.3	3.2	1.1	30.5	9.9	0.0	55.3	58.6	53.8
Sweden	1237	48.3	4.3	1.6	37.9	7.8	0.1	48.3	51.4	46.1
United States	991	35.4	9.1	2.5	43.7	9.3	0.0	35.4	36.6	34.7
International Avg (n=9)	8108	45.6	4.9	2.1	34.1	13.1	0.2	45.6	47.2	44.8

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P3\_11 (PA23066): Wave Phenom. & Atomic/Nuclear / Applying Type: CR 1 Point  
Label: Complete equation for reaction

COUNTRY	N	10 %	11 %	70 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1302	15.6	1.2	11.0	59.6	12.5	0.2	16.7	13.5	19.6
Italy	1134	2.5	1.0	2.5	20.4	73.3	0.3	3.5	2.3	4.6
Lebanon	379	39.6	0.7	3.2	36.0	19.5	1.1	40.3	40.9	40.0
Norway	820	35.1	17.2	12.5	27.8	7.4	0.0	52.3	49.4	53.4
Portugal	605	15.5	1.7	3.8	60.2	18.7	0.2	17.1	19.6	16.2
Russian Federation	1281	49.8	1.5	7.3	29.6	11.7	0.1	51.3	53.1	50.0
Slovenia	367	21.5	10.7	11.1	33.3	23.3	0.0	32.3	33.9	31.5
Sweden	1237	17.4	16.7	14.7	31.9	19.3	0.1	34.0	35.6	33.0
United States	991	7.0	1.7	3.4	63.3	24.5	0.0	8.8	4.1	11.8
International Avg (n=9)	8116	22.7	5.8	7.7	40.2	23.3	0.2	28.5	28.0	28.9

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P4\_01 (PA33078): Mechanics & Thermodynamics / Reasoning Type: MC Key: A  
Label: Oxygen temperature ratio

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1323	22.7	22.7	14.1	27.3	29.9	6.0	0.0	18.8	25.9
Italy	1148	43.3	43.3	16.1	15.7	12.8	11.9	0.2	42.6	44.0
Lebanon	386	41.6	41.6	12.6	18.2	11.2	16.3	0.2	48.4	38.0
Norway	831	34.8	34.8	17.2	21.3	23.8	3.0	0.0	28.5	37.2
Portugal	590	44.2	44.2	15.9	20.4	12.4	6.7	0.4	42.7	44.8
Russian Federation	1269	67.1	67.1	6.9	14.5	10.1	1.5	0.0	64.8	68.8
Slovenia	369	60.6	60.6	12.4	13.1	11.1	2.8	0.0	54.4	63.2
Sweden	1232	32.0	32.0	17.1	24.9	23.1	2.8	0.1	29.9	33.7
United States	985	43.2	43.2	14.5	22.8	18.5	0.9	0.0	37.8	46.5
International Avg (n=9)	8133	43.3	43.3	14.1	19.8	17.0	5.8	0.1	40.9	44.7

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P4\_02 (PA33088): Mechanics & Thermodynamics / Knowing Type: MC Key: A  
Label: Force of Sun on two planets

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1323	27.8	27.8	50.7	9.3	11.7	0.5	0.0	19.7	34.6
Italy	1148	53.7	53.7	34.0	2.4	8.0	1.7	0.2	46.4	60.2
Lebanon	386	25.8	25.8	42.1	11.6	14.2	5.8	0.6	31.1	23.0
Norway	831	65.8	65.8	25.3	4.7	3.0	1.3	0.0	59.0	68.4
Portugal	590	56.6	56.6	29.3	4.4	9.1	0.2	0.4	50.8	58.9
Russian Federation	1269	77.3	77.3	16.0	3.5	2.9	0.1	0.2	74.4	79.4
Slovenia	369	74.8	74.8	16.7	2.6	5.9	0.0	0.0	69.1	77.1
Sweden	1232	55.3	55.3	28.7	5.3	3.7	6.9	0.1	52.9	57.1
United States	985	60.2	60.2	28.2	5.4	5.7	0.7	0.0	50.5	65.9
International Avg (n=9)	8133	55.2	55.2	30.1	5.5	7.1	1.9	0.2	50.4	58.3

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P4\_03 (PA33058): Mechanics & Thermodynamics / Applying      Type: CR    2 Points  
Label: Skiing collision

COUNTRY	N	20 %	10 %	11 %	79 %	OMITTED %	NOT REACHED %	V1 %	V2 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1323	11.3	4.5	1.4	46.6	36.1	0.0	17.3	11.3	8.9	13.4
Italy	1146	12.3	5.1	1.1	36.3	45.1	0.2	18.4	12.3	7.6	16.4
Lebanon	386	47.2	12.1	5.0	24.2	11.0	0.6	64.3	47.2	59.0	41.0
Norway	830	56.9	8.6	1.8	23.0	9.7	0.0	67.3	56.9	61.3	55.2
Portugal	590	28.9	4.2	1.1	45.4	20.1	0.4	34.1	28.9	31.6	27.8
Russian Federation	1269	36.8	32.1	0.7	15.4	14.8	0.2	69.6	36.8	38.8	35.4
Slovenia	369	48.6	13.4	1.8	31.9	4.4	0.0	63.7	48.6	56.5	45.2
Sweden	1232	25.5	6.2	2.6	49.8	15.8	0.2	34.2	25.5	25.3	25.6
United States	985	35.3	15.9	1.0	42.2	5.6	0.0	52.2	35.3	34.8	35.6
International Avg (n=9)	8130	33.6	11.3	1.8	35.0	18.1	0.2	46.8	33.6	36.0	32.8

V1 = Percent scoring 1 pt or better;    V2 = Percent scoring 2 pts;    Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P4\_04 (PA33057): Mechanics & Thermodynamics / Reasoning Type: MC Key: C  
Label: Final velocity of colliding balls

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1323	23.7	20.1	47.1	23.7	6.8	2.2	0.1	22.5	24.7
Italy	1148	33.0	17.9	40.9	33.0	4.5	3.3	0.4	30.0	35.7
Lebanon	386	24.6	18.1	42.7	24.6	9.0	4.8	0.9	21.6	26.1
Norway	831	55.0	12.1	30.0	55.0	2.2	0.8	0.0	44.6	59.1
Portugal	590	43.2	17.2	35.7	43.2	3.0	0.6	0.4	36.1	45.9
Russian Federation	1269	36.2	9.9	50.8	36.2	2.6	0.3	0.2	29.5	41.1
Slovenia	369	47.8	10.0	40.4	47.8	1.9	0.0	0.0	39.1	51.4
Sweden	1232	39.7	14.2	40.7	39.7	3.9	1.3	0.2	35.2	43.2
United States	985	50.1	16.4	30.0	50.1	3.1	0.5	0.0	42.4	54.7
International Avg (n=9)	8133	39.3	15.1	39.8	39.3	4.1	1.5	0.2	33.4	42.4

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P4\_05 (PA33047): Electricity & Magnetism / Applying      Type: CR    1 Point  
Label: Rubbed balloon sticks to wall

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1323	1.4	84.6	13.8	0.2	1.4	1.5	1.3
Italy	1148	5.7	66.9	27.0	0.4	5.7	5.4	5.9
Lebanon	386	8.0	66.9	24.1	1.0	8.0	7.2	8.5
Norway	831	4.7	80.4	14.9	0.0	4.7	6.1	4.2
Portugal	590	1.6	76.1	21.9	0.4	1.6	0.8	1.9
Russian Federation	1269	8.8	74.2	16.7	0.2	8.8	8.1	9.3
Slovenia	369	11.8	75.5	12.7	0.0	11.8	10.3	12.4
Sweden	1230	13.9	74.7	11.1	0.3	13.9	16.8	11.7
United States	985	16.2	79.5	4.3	0.0	16.2	14.8	17.1
International Avg (n=9)	8131	8.0	75.4	16.3	0.3	8.0	7.9	8.0

V1 = Percent scoring 1 pt or better;    V2 = Percent scoring 2 pts;    Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.



P4\_06 (PA33012): Electricity & Magnetism / Applying Type: MC Key: C  
Label: Pacemakers and electrical fields

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1323	19.1	3.6	3.8	19.1	70.7	2.7	0.2	15.6	22.0
Italy	1148	28.0	6.4	3.8	28.0	54.8	6.4	0.6	26.1	29.8
Lebanon	386	12.4	5.9	8.5	12.4	63.1	8.9	1.2	13.2	12.0
Norway	831	43.7	6.4	3.9	43.7	44.2	1.7	0.0	38.7	45.7
Portugal	590	25.9	10.1	2.1	25.9	59.7	1.8	0.4	24.7	26.4
Russian Federation	1269	34.7	1.6	1.8	34.7	60.5	1.1	0.3	31.9	36.7
Slovenia	369	56.8	3.6	0.2	56.8	38.6	0.7	0.0	42.5	62.7
Sweden	1232	34.2	3.2	2.6	34.2	57.3	2.2	0.5	29.4	37.7
United States	985	41.2	5.4	4.9	41.2	47.9	0.6	0.0	31.1	47.2
International Avg (n=9)	8133	32.9	5.1	3.5	32.9	55.2	2.9	0.4	28.1	35.6

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P4\_07 (PA33120): Electricity & Magnetism / Reasoning Type: MC Key: B  
 Label: Deflected electron beam

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	.	.	.	.	.	.	.	.	.	.
Italy	1148	26.6	23.7	26.6	27.6	13.8	7.4	0.9	25.1	27.9
Lebanon	386	27.5	18.3	27.5	25.6	14.8	12.6	1.2	26.9	27.8
Norway	831	39.4	33.1	39.4	12.1	12.9	2.4	0.0	36.7	40.5
Portugal	590	13.2	10.7	13.2	41.8	31.2	2.6	0.4	17.6	11.4
Russian Federation	1269	50.4	23.5	50.4	16.0	7.6	2.1	0.3	48.6	51.8
Slovenia	369	35.6	36.8	35.6	16.4	10.4	0.8	0.0	34.6	36.0
Sweden	1232	38.7	22.8	38.7	19.4	15.7	2.9	0.5	42.5	35.8
United States	985	22.6	20.7	22.6	36.2	20.0	0.5	0.0	22.2	22.9
International Avg (n=8)	6810	31.7	23.7	31.7	24.4	15.8	3.9	0.4	31.8	31.8

DIFF = Percent correct  
 Because of missing gender information, some totals may appear inconsistent.

P4\_08A (PA33079A): Wave Phenom. & Atomic/Nuclear / Knowing Type: MC Key: D  
 Label: Electromagnetic radiation

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1323	39.8	14.4	24.8	18.6	39.8	2.0	0.3	34.5	44.2
Italy	1148	31.8	18.7	18.8	20.7	31.8	8.5	1.5	29.1	34.2
Lebanon	386	25.7	14.1	18.8	35.0	25.7	5.2	1.2	24.8	26.2
Norway	831	49.1	8.9	15.2	24.0	49.1	2.8	0.0	36.6	54.0
Portugal	590	44.4	25.4	15.7	13.3	44.4	0.6	0.6	31.3	49.5
Russian Federation	1269	56.3	20.0	8.7	12.6	56.3	2.1	0.3	55.8	56.6
Slovenia	369	46.4	13.0	14.9	24.2	46.4	1.6	0.0	43.7	47.5
Sweden	1232	39.2	14.3	15.9	25.7	39.2	4.0	1.0	32.8	44.0
United States	985	34.3	21.6	18.4	25.3	34.3	0.3	0.0	28.7	37.7
International Avg (n=9)	8133	40.8	16.7	16.8	22.1	40.8	3.0	0.6	35.3	43.8

DIFF = Percent correct  
 Because of missing gender information, some totals may appear inconsistent.

P4\_08B (PA33079B): Wave Phenom. & Atomic/Nuclear / Reasoning Type: CR 1 Point  
Label: Harmful radiation

COUNTRY	N	10 %	70 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1323	12.5	7.8	75.6	3.4	0.6	12.5	10.4	14.2
Italy	1147	15.4	2.9	68.5	11.1	2.1	15.4	10.1	20.2
Lebanon	386	36.5	3.7	50.2	8.2	1.3	36.5	40.5	34.4
Norway	831	53.0	11.9	33.3	1.7	0.0	53.0	44.2	56.4
Portugal	590	38.1	10.9	48.3	1.9	0.8	38.1	35.0	39.3
Russian Federation	1269	32.8	5.8	57.9	3.1	0.4	32.8	31.4	33.9
Slovenia	369	35.3	12.0	52.0	0.7	0.0	35.3	34.4	35.8
Sweden	1227	29.6	6.2	60.5	2.6	1.1	29.6	30.6	28.8
United States	985	34.9	13.4	50.3	1.4	0.0	34.9	30.5	37.5
International Avg (n=9)	8127	32.0	8.3	55.2	3.8	0.7	32.0	29.7	33.4

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P4\_09 (PA33116): Wave Phenom. & Atomic/Nuclear / Knowing Type: MC Key: A  
Label: Nuclear reaction mass

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1323	33.0	33.0	18.3	34.0	10.9	3.1	0.7	29.0	36.3
Italy	1148	28.9	28.9	17.8	32.2	7.0	11.7	2.4	24.1	33.2
Lebanon	386	43.9	43.9	10.8	23.7	8.3	11.0	2.3	47.3	42.2
Norway	831	59.7	59.7	9.7	19.3	8.3	2.9	0.1	49.7	63.5
Portugal	590	25.6	25.6	27.8	31.7	9.7	4.4	0.8	17.9	28.5
Russian Federation	1269	51.2	51.2	13.7	26.0	6.1	2.6	0.4	48.5	53.2
Slovenia	369	59.2	59.2	12.3	18.2	8.5	1.8	0.0	48.3	63.7
Sweden	1232	50.0	50.0	16.6	22.3	6.9	3.0	1.1	46.9	52.4
United States	985	42.5	42.5	23.0	25.9	7.4	1.2	0.0	35.6	46.6
International Avg (n=9)	8133	43.8	43.8	16.7	25.9	8.1	4.6	0.9	38.6	46.6

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P4\_10 (PA33070): Wave Phenom. & Atomic/Nuclear / Knowing Type: CR 1 Point  
Label: Wavelength of water wave

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1323	56.4	31.6	10.6	1.4	56.4	54.6	57.9
Italy	1148	39.5	22.5	34.6	3.4	39.5	37.4	41.4
Lebanon	386	40.0	26.4	29.0	4.6	40.0	48.3	35.8
Norway	831	71.9	19.6	8.2	0.4	71.9	64.6	74.8
Portugal	590	71.7	19.4	7.2	1.8	71.7	81.8	67.7
Russian Federation	1269	60.1	21.7	17.6	0.7	60.1	60.7	59.7
Slovenia	366	75.6	20.6	3.8	0.0	75.6	73.9	76.3
Sweden	1228	62.7	27.0	8.9	1.4	62.7	65.0	61.0
United States	985	55.8	39.6	4.6	0.0	55.8	53.1	57.3
International Avg (n=9)	8126	59.3	25.4	13.8	1.5	59.3	59.9	59.1

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P4\_11 (PA33011): Wave Phenom. & Atomic/Nuclear / Applying Type: CR 1 Point  
Label: Semiconductor in solar panels

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1323	45.0	51.3	1.6	2.0	45.0	45.6	44.5
Italy	1148	27.5	55.3	10.9	6.3	27.5	24.5	30.1
Lebanon	386	34.9	46.0	9.0	10.2	34.9	34.3	35.1
Norway	831	49.5	48.4	1.2	0.9	49.5	52.5	48.4
Portugal	590	54.1	41.4	1.6	2.9	54.1	60.6	51.6
Russian Federation	1269	38.9	55.0	4.5	1.7	38.9	34.0	42.4
Slovenia	369	56.5	42.8	0.7	0.0	56.5	50.0	59.2
Sweden	1229	41.8	51.5	4.2	2.5	41.8	43.5	40.5
United States	985	51.0	46.3	1.9	0.8	51.0	49.5	51.9
International Avg (n=9)	8130	44.4	48.7	4.0	3.0	44.4	43.8	44.9

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P5\_01 (PA23048): Wave Phenom. & Atomic/Nuclear / Knowing Type: MC Key: C  
Label: Interval with wavelengths of light

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1324	96.1	2.7	0.1	96.1	0.5	0.1	0.4	95.0	97.1
Italy	1140	59.1	5.6	5.8	59.1	20.8	7.7	1.1	57.5	60.4
Lebanon	387	81.8	3.2	2.4	81.8	11.4	1.0	0.2	80.2	82.8
Norway	821	91.2	1.3	2.1	91.2	4.7	0.7	0.0	89.5	91.8
Portugal	601	83.4	1.3	2.1	83.4	12.2	0.7	0.3	85.5	82.7
Russian Federation	1271	77.1	6.1	3.3	77.1	12.1	1.0	0.4	78.1	76.3
Slovenia	363	88.6	2.1	2.4	88.6	6.0	0.7	0.3	82.4	91.0
Sweden	1255	82.5	3.6	3.5	82.5	9.5	0.8	0.1	84.5	81.3
United States	964	64.8	7.5	7.8	64.8	17.9	1.9	0.0	62.3	66.4
International Avg (n=9)	8126	80.5	3.7	3.3	80.5	10.6	1.6	0.3	79.4	81.1

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.



P5\_02 (PA23039): Electricity & Magnetism / Applying Type: MC Key: A  
Label: Internal resistance of battery

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1324	29.5	29.5	22.9	21.5	17.3	8.5	0.4	30.8	28.3
Italy	1140	26.7	26.7	18.3	23.7	7.5	22.5	1.3	25.1	28.0
Lebanon	367	39.2	39.2	23.5	14.8	10.6	11.8	0.2	38.6	39.5
Norway	821	32.1	32.1	24.3	27.7	9.0	6.9	0.0	29.5	33.2
Portugal	601	28.3	28.3	23.5	23.8	14.0	10.0	0.3	27.0	28.7
Russian Federation	1271	54.8	54.8	18.4	17.4	4.2	4.8	0.4	52.0	56.9
Slovenia	363	40.7	40.7	19.9	21.3	8.7	9.2	0.3	36.9	42.1
Sweden	1255	31.8	31.8	27.5	25.9	10.0	4.7	0.1	28.7	33.8
United States	964	29.4	29.4	27.1	27.1	11.9	4.5	0.0	25.8	31.7
International Avg (n=9)	8106	34.7	34.7	22.8	22.6	10.4	9.2	0.3	32.7	35.8

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P5\_03 (PA23035): Electricity & Magnetism / Applying Type: CR 1 Point  
 Label: Resistance of bulb when it shines

COUNTRY	N	10 %	70 %	71 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1324	15.5	2.8	0.2	37.1	43.9	0.4	15.5	10.3	20.4
Italy	1140	26.3	5.0	0.2	23.2	44.0	1.4	26.3	25.2	27.3
Lebanon	391	51.9	9.7	0.0	12.6	25.1	0.7	51.9	57.0	48.8
Norway	821	32.0	4.5	0.3	37.5	25.6	0.0	32.0	30.1	32.8
Portugal	601	27.3	4.0	0.5	43.3	24.4	0.5	27.3	24.7	28.1
Russian Federation	1271	48.7	10.8	1.2	14.8	23.9	0.6	48.7	46.2	50.5
Slovenia	363	67.8	7.4	1.3	16.0	7.1	0.3	67.8	58.2	71.5
Sweden	1254	39.4	4.1	0.2	36.2	19.9	0.2	39.4	39.9	39.1
United States	964	30.7	6.7	0.0	48.1	14.5	0.0	30.7	30.8	30.6
International Avg (n=9)	8129	37.7	6.1	0.4	29.9	25.4	0.4	37.7	35.8	38.8

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
 Because of missing gender information, some totals may appear inconsistent.

P5\_04 (PA23042): Electricity & Magnetism / Knowing Type: MC Key: A  
 Label: Paths particles follow

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1324	41.8	41.8	8.9	27.7	17.3	3.8	0.5	44.9	38.8
Italy	1140	42.3	42.3	8.2	27.2	13.8	7.0	1.5	38.4	45.6
Lebanon	363	33.1	33.1	12.4	17.8	29.4	7.1	0.2	31.6	34.0
Norway	821	64.1	64.1	5.4	21.5	7.4	1.4	0.2	64.2	64.1
Portugal	601	44.6	44.6	5.5	26.0	20.6	2.9	0.5	60.2	39.7
Russian Federation	1271	67.3	67.3	6.4	14.8	8.3	2.4	0.6	69.3	65.9
Slovenia	363	57.3	57.3	6.9	28.1	6.5	0.9	0.3	60.0	56.2
Sweden	1255	48.8	48.8	5.7	28.4	15.9	1.0	0.2	48.9	48.7
United States	964	45.2	45.2	6.7	26.1	19.7	2.3	0.0	46.5	44.3
International Avg (n=9)	8102	49.4	49.4	7.3	24.2	15.4	3.2	0.4	51.6	48.6

DIFF = Percent correct  
 Because of missing gender information, some totals may appear inconsistent.

P5\_05 (PA23012): Mechanics & Thermodynamics / Reasoning Type: CR 1 Point  
Label: Tension of string as system falls

COUNTRY	N	10 %	70 %	71 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1324	6.0	15.5	2.9	32.2	42.6	0.8	6.0	3.1	8.8
Italy	1139	4.6	5.9	8.7	19.0	60.1	1.7	4.6	2.0	6.6
Lebanon	391	8.5	11.2	0.0	36.1	41.3	2.9	8.5	7.2	9.3
Norway	821	29.2	13.9	16.9	18.6	21.1	0.2	29.2	14.3	35.5
Portugal	601	11.8	19.9	11.4	19.5	36.8	0.7	11.8	4.8	14.0
Russian Federation	1271	22.1	22.2	10.1	14.9	29.9	0.7	22.1	17.9	25.0
Slovenia	362	34.3	12.9	10.3	28.8	13.5	0.3	34.3	13.8	42.0
Sweden	1253	17.6	8.1	8.4	32.1	33.6	0.2	17.6	9.7	22.7
United States	964	25.4	13.4	20.7	31.0	9.4	0.1	25.4	20.9	28.3
International Avg (n=9)	8126	17.7	13.7	9.9	25.8	32.0	0.8	17.7	10.4	21.4

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P5\_07 (PA23051): Mechanics & Thermodynamics / Applying Type: CR 1 Point  
Label: Energy released for temp to fall

COUNTRY	N	10 %	70 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1324	15.9	15.0	19.5	48.3	1.3	15.9	12.6	19.0
Italy	1138	13.0	20.0	11.9	52.4	2.7	13.0	9.7	15.7
Lebanon	391	5.0	3.3	22.9	65.2	3.6	5.0	5.1	4.9
Norway	821	27.8	7.9	18.3	45.7	0.4	27.8	19.6	31.2
Portugal	601	33.1	28.6	17.0	20.5	0.8	33.1	28.5	34.5
Russian Federation	1271	56.7	18.4	5.2	18.6	1.1	56.7	52.6	59.7
Slovenia	363	72.0	8.5	11.2	7.7	0.6	72.0	69.0	73.2
Sweden	1254	40.2	11.5	17.0	30.8	0.5	40.2	36.5	42.7
United States	964	19.9	19.4	36.0	24.6	0.2	19.9	16.0	22.3
International Avg (n=9)	8127	31.5	14.7	17.7	34.9	1.3	31.5	27.7	33.7

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P5\_08 (PA23085): Mechanics & Thermodynamics / Applying      Type: MC      Key: C  
Label: Temp when two rods have same length

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1324	39.6	6.6	25.4	39.6	15.9	10.7	1.9	35.0	44.0
Italy	1140	32.5	11.2	26.5	32.5	7.6	18.7	3.5	28.3	36.0
Lebanon	342	39.3	8.7	20.4	39.3	9.7	20.1	1.8	41.0	38.2
Norway	821	46.5	4.8	29.0	46.5	12.0	6.7	1.0	47.1	46.3
Portugal	601	43.3	6.2	22.9	43.3	14.6	11.9	1.0	42.4	43.6
Russian Federation	1271	46.6	9.8	24.4	46.6	6.1	11.6	1.5	47.0	46.3
Slovenia	363	47.5	6.1	15.9	47.5	15.7	13.7	1.1	37.0	51.5
Sweden	1255	40.2	7.8	24.1	40.2	17.9	9.2	0.8	35.1	43.5
United States	964	49.3	5.8	28.4	49.3	10.4	6.0	0.2	50.4	48.5
International Avg (n=9)	8081	42.8	7.4	24.1	42.8	12.2	12.0	1.4	40.4	44.2

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P5\_09 (PA23130): Wave Phenom. & Atomic/Nuclear / Knowing Type: CR 2 Points  
 Label: Why petals look black in green light

COUNTRY	N	20 %	10 %	70 %	79 %	OMITTED %	NOT REACHED %	V1 %	V2 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1323	12.1	3.8	1.5	69.1	11.3	2.2	15.8	12.1	8.7	15.3
Italy	1138	6.1	3.3	1.6	31.7	52.7	4.5	9.4	6.1	4.0	7.9
Lebanon	391	3.5	4.1	1.3	44.1	40.8	6.2	7.6	3.5	3.0	3.7
Norway	821	26.4	8.6	3.8	37.1	23.1	1.0	35.0	26.4	26.3	26.5
Portugal	601	15.4	7.3	1.5	35.7	37.8	2.4	22.7	15.4	9.5	17.2
Russian Federation	1271	12.9	14.1	4.5	34.6	31.4	2.4	27.0	12.9	11.8	13.6
Slovenia	363	18.6	12.9	2.0	41.5	23.0	2.0	31.5	18.6	7.1	23.0
Sweden	1253	15.0	7.5	3.8	40.9	31.6	1.2	22.5	15.0	15.3	14.8
United States	964	18.6	7.7	5.6	58.2	9.7	0.2	26.3	18.6	14.4	21.2
International Avg (n=9)	8125	14.3	7.7	2.9	43.7	29.1	2.5	22.0	14.3	11.1	15.9

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
 Because of missing gender information, some totals may appear inconsistent.

P5\_10 (PA23086): Wave Phenom. & Atomic/Nuclear / Reasoning Type: CR 1 Point  
Label: Explain blue as hotter than red

COUNTRY	N	10 %	11 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1323	4.0	28.6	44.9	20.0	2.5	32.6	28.5	36.6
Italy	1136	1.3	17.3	27.8	47.7	6.0	18.5	15.5	21.0
Lebanon	391	6.4	4.9	27.4	51.5	9.8	11.3	12.9	10.3
Norway	821	0.3	28.6	55.1	14.5	1.5	28.9	28.1	29.2
Portugal	601	3.3	8.6	64.1	21.2	2.8	11.9	9.5	12.7
Russian Federation	1271	9.9	13.3	26.5	45.8	4.5	23.2	22.2	23.9
Slovenia	363	4.7	26.9	44.1	21.0	3.3	31.6	19.0	36.4
Sweden	1251	0.7	23.6	49.0	24.3	2.4	24.3	21.6	26.1
United States	964	0.1	46.2	45.6	7.8	0.3	46.3	45.4	46.9
International Avg (n=9)	8121	3.4	22.0	42.7	28.2	3.7	25.4	22.5	27.0

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.



P5\_11 (PA23064): Wave Phenom. & Atomic/Nuclear / Applying Type: MC Key: B  
Label: Years passed since mammoth died

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1324	37.7	7.6	37.7	33.5	13.8	4.4	3.0	31.1	43.9
Italy	1140	41.1	8.7	41.1	23.5	9.9	10.5	6.3	38.1	43.6
Lebanon	357	42.5	6.7	42.5	28.6	5.9	10.3	6.1	41.8	42.9
Norway	821	65.8	4.1	65.8	15.7	10.3	2.4	1.6	60.1	68.2
Portugal	601	51.7	6.5	51.7	24.2	8.4	4.8	4.5	42.4	54.6
Russian Federation	1271	49.0	6.7	49.0	24.8	8.5	5.1	5.8	41.5	54.4
Slovenia	363	57.4	4.6	57.4	20.1	8.7	4.9	4.3	51.6	59.6
Sweden	1255	57.0	5.8	57.0	20.8	9.6	4.3	2.6	54.5	58.7
United States	964	57.9	4.9	57.9	26.0	7.3	2.6	1.2	49.6	63.2
International Avg (n=9)	8096	51.1	6.2	51.1	24.1	9.2	5.5	3.9	45.6	54.3

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P6\_01 (PA33059): Mechanics & Thermodynamics / Knowing      Type: MC    Key: C  
Label: Work done on a gas

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1307	64.0	15.5	6.7	64.0	11.6	2.1	0.1	62.3	65.5
Italy	1139	61.0	11.7	6.2	61.0	15.4	5.2	0.4	55.8	65.3
Lebanon	367	52.7	13.6	8.2	52.7	16.6	7.6	1.4	55.4	51.3
Norway	820	70.2	13.7	3.1	70.2	10.7	2.4	0.0	65.9	71.7
Portugal	612	80.3	9.4	4.2	80.3	5.9	0.2	0.2	80.2	80.3
Russian Federation	1270	77.0	5.8	8.2	77.0	7.4	1.6	0.1	71.6	80.7
Slovenia	363	81.4	6.2	3.9	81.4	7.3	1.1	0.0	73.6	84.5
Sweden	1242	62.4	11.4	6.5	62.4	16.3	3.3	0.1	57.6	65.6
United States	972	71.0	10.8	6.0	71.0	9.9	2.2	0.0	68.9	72.4
International Avg (n=9)	8092	68.9	10.9	5.9	68.9	11.2	2.9	0.3	65.7	70.8

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P6\_02 (PA33073): Mechanics & Thermodynamics / Applying Type: CR 2 Points  
Label: Skiing down a hill

COUNTRY	N	20 %	10 %	11 %	12 %	79 %	OMITTED %	NOT REACHED %	V1 %	V2 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1307	6.9	5.0	1.1	2.3	41.2	43.2	0.2	15.3	6.9	6.0	7.8
Italy	1137	16.5	5.5	1.8	7.5	28.4	39.8	0.4	31.4	16.5	18.0	15.2
Lebanon	383	49.3	10.5	5.0	1.3	15.2	16.6	2.1	66.1	49.3	58.3	44.0
Norway	820	52.6	3.8	2.6	20.2	12.7	7.9	0.1	79.3	52.6	62.7	48.8
Portugal	612	37.2	11.8	3.5	19.6	18.2	9.5	0.2	72.1	37.2	36.3	37.6
Russian Federation	1270	34.2	15.4	1.0	13.0	16.4	19.9	0.2	63.5	34.2	37.3	32.0
Slovenia	363	39.4	10.4	1.9	19.1	24.6	4.2	0.3	70.8	39.4	43.4	37.8
Sweden	1242	39.7	2.1	2.8	14.0	26.2	15.0	0.2	58.6	39.7	45.3	35.8
United States	972	19.0	4.3	2.4	37.7	32.9	3.7	0.0	63.4	19.0	14.8	21.7
International Avg (n=9)	8106	32.8	7.6	2.5	15.0	24.0	17.8	0.4	57.8	32.8	35.8	31.2

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P6\_03 (PA33019): Mechanics & Thermodynamics / Reasoning Type: MC Key: D  
Label: Reaction force on roller coaster

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1307	22.3	19.4	26.8	26.9	22.3	4.4	0.2	23.3	21.4
Italy	1139	32.5	16.2	21.8	23.5	32.5	5.5	0.5	32.0	32.9
Lebanon	374	24.1	16.4	33.3	17.5	24.1	6.4	2.3	25.6	23.3
Norway	820	40.4	8.9	24.5	24.8	40.4	1.3	0.1	32.8	43.2
Portugal	612	35.8	6.9	16.9	38.3	35.8	1.9	0.2	38.4	34.9
Russian Federation	1270	42.1	11.5	23.6	21.1	42.1	1.4	0.2	37.5	45.3
Slovenia	363	35.9	8.8	31.0	23.1	35.9	0.8	0.3	29.9	38.3
Sweden	1243	26.3	11.9	30.5	29.6	26.3	1.1	0.4	24.3	27.7
United States	972	30.7	15.5	24.2	28.2	30.7	1.4	0.0	31.8	30.0
International Avg (n=9)	8100	32.2	12.8	25.9	25.9	32.2	2.7	0.5	30.6	33.0

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P6\_04 (PA33015): Mechanics & Thermodynamics / Knowing      Type: MC      Key: C  
Label: Acceleration of box along slope

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1307	17.1	10.4	39.3	17.1	29.6	3.2	0.4	16.8	17.5
Italy	1139	36.6	8.6	17.8	36.6	28.7	7.9	0.6	33.4	39.3
Lebanon	377	60.7	6.2	7.3	60.7	20.6	3.0	2.2	65.3	57.8
Norway	820	49.4	8.4	9.3	49.4	31.7	1.2	0.1	55.6	47.0
Portugal	612	47.8	8.1	9.3	47.8	32.1	2.4	0.2	54.9	45.2
Russian Federation	1270	60.5	4.9	8.3	60.5	25.2	0.8	0.3	64.0	58.0
Slovenia	363	48.5	8.2	9.8	48.5	31.7	1.5	0.3	46.9	49.2
Sweden	1243	37.1	13.0	18.1	37.1	26.6	4.6	0.5	37.7	36.7
United States	972	48.8	8.0	11.6	48.8	30.2	1.4	0.0	49.0	48.7
International Avg (n=9)	8103	45.2	8.4	14.5	45.2	28.5	2.9	0.5	47.1	44.4

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P6\_05 (PA33086): Mechanics & Thermodynamics / Knowing      Type: MC      Key: B  
Label: Speed of satellite orbit

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1307	31.7	62.3	31.7	3.5	1.8	0.3	0.4	28.4	34.8
Italy	1139	29.8	56.6	29.8	6.2	3.3	3.3	0.7	25.4	33.5
Lebanon	381	22.2	57.1	22.2	5.9	5.4	6.4	2.9	22.4	22.2
Norway	820	59.4	37.3	59.4	1.6	1.0	0.5	0.1	57.0	60.3
Portugal	612	57.1	39.5	57.1	1.8	1.0	0.4	0.2	54.9	57.9
Russian Federation	1270	45.8	48.7	45.8	2.7	1.8	0.7	0.3	44.7	46.5
Slovenia	363	44.9	49.0	44.9	3.7	1.6	0.5	0.3	35.4	48.7
Sweden	1243	48.6	41.3	48.6	4.2	3.1	2.2	0.6	43.5	52.1
United States	972	35.5	54.9	35.5	5.5	2.7	1.3	0.1	28.9	39.7
International Avg (n=9)	8107	41.7	49.6	41.7	3.9	2.4	1.7	0.6	37.9	44.0

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P6\_06 (PA33035): Electricity & Magnetism / Applying Type: CR 1 Point  
Label: Direction of current in moving coil

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1307	43.4	39.1	17.0	0.4	43.4	42.1	44.6
Italy	1138	46.2	26.3	26.4	1.1	46.2	43.5	48.5
Lebanon	383	58.5	20.9	17.2	3.4	58.5	61.4	56.8
Norway	820	60.4	30.2	9.3	0.1	60.4	64.8	58.8
Portugal	612	36.5	44.5	18.4	0.6	36.5	37.5	36.2
Russian Federation	1270	52.2	29.3	18.0	0.4	52.2	51.5	52.7
Slovenia	363	59.6	35.8	4.3	0.3	59.6	55.3	61.2
Sweden	1243	54.4	35.5	9.5	0.6	54.4	57.8	52.0
United States	972	39.7	49.4	10.8	0.1	39.7	40.6	39.2
International Avg (n=9)	8108	50.1	34.6	14.5	0.8	50.1	50.5	50.0

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P6\_07 (PA33119): Electricity & Magnetism / Reasoning Type: CR 2 Points  
Label: Magnet moves aluminum (explain)

COUNTRY	N	20 %	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	V2 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	.	.	.	.	.	.	.	.	.	.
Italy	1139	2.7	1.3	79.7	14.9	1.5	4.0	2.7	2.0	3.3
Lebanon	383	4.4	6.9	74.8	9.3	4.7	11.2	4.4	6.4	3.2
Norway	820	12.9	6.8	75.4	4.6	0.2	19.7	12.9	13.5	12.7
Portugal	612	0.9	0.1	90.9	6.7	1.5	1.0	0.9	1.8	0.5
Russian Federation	1270	2.2	7.5	75.1	14.0	1.2	9.7	2.2	1.6	2.6
Slovenia	363	7.0	3.1	86.6	2.8	0.6	10.1	7.0	2.9	8.6
Sweden	1243	6.6	2.2	86.6	4.0	0.6	8.8	6.6	8.1	5.5
United States	972	3.7	1.9	92.1	2.2	0.1	5.6	3.7	1.4	5.1
International Avg (n=8)	6802	5.0	3.7	82.7	7.3	1.3	8.8	5.0	4.7	5.2

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.



P6\_08 (PA33046): Electricity & Magnetism / Applying Type: CR 1 Point  
Label: Beads as point charges

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1307	14.8	67.9	16.2	1.1	14.8	13.4	16.1
Italy	1139	42.5	29.0	26.9	1.6	42.5	37.0	47.1
Lebanon	383	26.7	41.7	26.9	4.7	26.7	22.9	29.1
Norway	820	50.0	38.9	10.8	0.2	50.0	45.3	51.8
Portugal	612	41.0	45.3	12.0	1.6	41.0	26.8	46.2
Russian Federation	1270	48.2	34.8	15.9	1.2	48.2	46.6	49.2
Slovenia	363	48.6	43.6	7.2	0.6	48.6	39.2	52.4
Sweden	1243	51.7	36.0	11.6	0.6	51.7	47.3	54.7
United States	972	34.6	58.8	6.5	0.1	34.6	27.7	39.0
International Avg (n=9)	8109	39.8	44.0	14.9	1.3	39.8	34.0	42.8

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P6\_09 (PA33083): Wave Phenom. & Atomic/Nuclear / Reasoning Type: MC Key: A  
Label: Ray of light through prism

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1307	60.4	60.4	11.6	8.0	17.1	1.6	1.3	56.1	64.2
Italy	1139	30.9	30.9	14.8	13.7	27.6	11.2	1.8	27.6	33.8
Lebanon	380	37.8	37.8	13.7	9.5	28.1	5.7	5.3	43.9	34.0
Norway	820	68.5	68.5	7.0	6.8	16.1	1.2	0.4	62.3	70.8
Portugal	612	54.3	54.3	9.7	9.9	20.4	2.9	2.8	44.1	58.0
Russian Federation	1270	61.8	61.8	10.1	6.7	18.4	1.7	1.3	58.3	64.3
Slovenia	363	60.2	60.2	11.0	5.3	22.6	0.5	0.6	46.1	65.7
Sweden	1243	57.0	57.0	10.6	8.0	20.1	3.2	1.2	54.1	58.9
United States	972	55.1	55.1	10.3	11.8	21.1	1.6	0.1	44.9	61.5
International Avg (n=9)	8106	54.0	54.0	11.0	8.9	21.3	3.3	1.6	48.6	56.8

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P6\_10 (PA33069): Wave Phenom. & Atomic/Nuclear / Applying Type: CR 1 Point  
Label: Wavelength of musical note

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1307	50.5	26.1	22.1	1.3	50.5	48.1	52.6
Italy	1139	58.2	13.5	26.3	2.0	58.2	55.7	60.4
Lebanon	383	62.8	16.6	14.1	6.5	62.8	68.6	59.3
Norway	820	68.6	17.0	14.0	0.4	68.6	72.8	67.0
Portugal	612	66.0	16.0	14.4	3.7	66.0	62.7	67.2
Russian Federation	1270	78.5	9.0	11.2	1.3	78.5	80.8	77.0
Slovenia	362	80.1	12.7	6.7	0.6	80.1	81.8	79.4
Sweden	1243	71.0	15.1	12.4	1.5	71.0	75.4	68.0
United States	972	69.2	22.5	8.2	0.1	69.2	65.4	71.6
International Avg (n=9)	8108	67.2	16.5	14.4	1.9	67.2	67.9	67.0

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P6\_11 (PA33114): Wave Phenom. & Atomic/Nuclear / Knowing Type: MC Key: B  
Label: Characteristics of electromagnetic radiaiton

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1307	62.3	13.4	62.3	16.3	3.0	3.3	1.6	60.8	63.8
Italy	1139	64.1	9.6	64.1	5.9	9.1	9.1	2.3	62.8	65.2
Lebanon	374	55.1	13.7	55.1	16.3	5.1	2.9	7.0	57.9	53.4
Norway	820	73.8	15.0	73.8	2.7	6.1	2.0	0.4	77.2	72.5
Portugal	612	50.6	11.8	50.6	8.3	21.8	3.6	3.9	42.4	53.6
Russian Federation	1270	80.8	7.6	80.8	3.1	5.4	1.6	1.5	82.2	79.9
Slovenia	363	69.5	17.2	69.5	4.4	6.4	1.9	0.6	63.0	72.1
Sweden	1243	68.7	13.7	68.7	4.3	9.8	1.7	1.7	67.3	69.7
United States	972	69.3	14.3	69.3	6.7	8.3	1.3	0.1	69.6	69.2
International Avg (n=9)	8100	66.0	12.9	66.0	7.5	8.3	3.0	2.1	64.8	66.6

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P6\_12 (PA33080): Wave Phenom. & Atomic/Nuclear / Applying Type: CR 1 Point  
Label: Iron bars radiate visible light

COUNTRY	N	10 %	11 %	70 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1307	13.1	6.3	2.4	74.8	1.4	1.9	19.4	16.1	22.3
Italy	1134	11.2	1.0	2.9	76.1	5.8	3.1	12.1	9.4	14.5
Lebanon	383	11.7	0.9	2.1	72.1	5.4	7.8	12.6	9.9	14.2
Norway	820	45.4	1.9	1.5	50.1	0.6	0.4	47.4	43.4	48.8
Portugal	612	22.8	0.7	4.5	66.8	1.0	4.1	23.6	14.1	27.0
Russian Federation	1270	23.8	2.6	2.3	65.9	3.5	1.9	26.4	24.2	27.9
Slovenia	363	24.8	1.0	0.9	71.2	1.5	0.6	25.9	12.4	31.2
Sweden	1241	26.1	1.1	1.2	67.5	1.8	2.3	27.2	21.2	31.2
United States	972	25.4	0.0	1.8	71.9	0.8	0.1	25.4	20.8	28.3
International Avg (n=9)	8102	22.7	1.7	2.2	68.5	2.4	2.5	24.4	19.1	27.3

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P7\_01 (PA33065): Mechanics & Thermodynamics / Applying      Type: MC      Key: B  
Label: Coefficient of friction of sled

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1309	38.5	11.6	38.5	30.1	5.8	13.7	0.3	36.7	40.2
Italy	1129	46.4	12.2	46.4	15.4	4.0	21.7	0.2	43.6	48.8
Lebanon	358	31.6	10.6	31.6	26.0	10.3	18.6	3.0	31.4	31.7
Norway	818	58.0	15.0	58.0	16.9	1.8	8.3	0.0	56.6	58.5
Portugal	613	48.4	22.0	48.4	19.7	2.6	7.3	0.1	45.4	49.3
Russian Federation	1277	74.7	11.1	74.7	9.0	0.6	4.7	0.0	78.4	72.1
Slovenia	369	62.6	13.5	62.6	13.8	1.8	8.0	0.3	62.7	62.6
Sweden	1242	50.7	13.2	50.7	23.3	5.5	7.0	0.4	52.3	49.6
United States	979	58.8	17.7	58.8	16.8	2.4	4.4	0.0	57.5	59.6
International Avg (n=9)	8094	52.2	14.1	52.2	19.0	3.9	10.4	0.5	51.6	52.5

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P7\_02A (PA33009A): Mechanics & Thermodynamics / Reasoning Type: CR 2 Points  
Label: Estimation of mass of planet

COUNTRY	N	20 %	10 %	11 %	79 %	OMITTED %	NOT REACHED %	V1 %	V2 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1309	4.0	1.4	2.9	35.6	55.8	0.3	8.3	4.0	3.5	4.4
Italy	1126	4.4	1.5	1.9	29.3	62.6	0.4	7.8	4.4	2.3	6.2
Lebanon	382	1.7	0.0	0.5	25.1	69.6	3.0	2.2	1.7	1.2	2.0
Norway	818	20.3	10.5	6.9	59.4	2.8	0.1	37.7	20.3	21.3	19.9
Portugal	613	24.2	7.0	9.4	31.6	27.6	0.1	40.7	24.2	30.6	22.3
Russian Federation	1277	21.2	2.8	10.1	20.8	45.0	0.1	34.1	21.2	19.3	22.5
Slovenia	368	13.3	2.4	2.7	56.9	24.4	0.3	18.4	13.3	8.0	15.7
Sweden	1242	13.5	0.7	4.2	43.8	37.4	0.4	18.4	13.5	12.7	14.0
United States	979	9.3	4.1	4.1	68.7	13.8	0.0	17.5	9.3	7.2	10.7
International Avg (n=9)	8114	12.4	3.4	4.7	41.3	37.7	0.5	20.6	12.4	11.8	13.1

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P7\_02B (PA33009B): Mechanics & Thermodynamics / Reasoning Type: MC Key: D  
Label: Spacecraft height in orbit

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1309	35.9	12.5	31.4	15.8	35.9	4.1	0.3	32.3	39.3
Italy	1129	30.3	8.3	23.6	11.1	30.3	26.2	0.5	22.5	36.9
Lebanon	340	30.2	5.0	26.4	16.2	30.2	19.0	3.1	29.9	30.4
Norway	818	54.9	1.7	32.6	8.1	54.9	2.6	0.1	43.6	59.6
Portugal	613	54.9	3.1	33.9	4.7	54.9	3.1	0.3	61.3	53.0
Russian Federation	1277	46.6	1.8	26.7	16.0	46.6	8.7	0.3	39.8	51.3
Slovenia	369	49.1	4.3	37.0	4.1	49.1	5.2	0.3	32.9	56.2
Sweden	1242	53.1	7.8	27.1	7.2	53.1	4.4	0.4	50.1	55.1
United States	979	50.4	4.9	31.3	9.2	50.4	4.3	0.0	40.8	56.6
International Avg (n=9)	8076	45.1	5.5	30.0	10.3	45.1	8.6	0.6	39.2	48.7

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.



P7\_03 (PA33002): Mechanics & Thermodynamics / Applying      Type: MC      Key: A  
Label: Energy in meteor explosion

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1309	77.2	77.2	7.2	5.6	8.9	0.6	0.4	72.2	82.0
Italy	1129	60.6	60.6	8.0	20.5	7.1	3.3	0.5	49.8	69.6
Lebanon	376	54.4	54.4	6.1	15.0	19.2	2.5	2.8	56.1	53.3
Norway	818	76.5	76.5	5.2	8.2	9.6	0.4	0.1	65.5	81.1
Portugal	613	76.6	76.6	4.5	10.5	7.2	0.8	0.4	72.7	77.8
Russian Federation	1277	73.6	73.6	7.6	10.2	8.3	0.1	0.3	71.3	75.2
Slovenia	369	83.2	83.2	3.0	6.1	6.9	0.5	0.3	75.9	86.4
Sweden	1243	84.7	84.7	2.3	3.0	8.6	1.0	0.4	78.4	88.9
United States	979	84.2	84.2	3.6	6.2	3.8	2.2	0.0	80.5	86.7
International Avg (n=9)	8113	74.6	74.6	5.3	9.5	8.9	1.3	0.6	69.1	77.9

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P7\_04 (PA33098): Wave Phenom. & Atomic/Nuclear / Knowing Type: MC Key: D  
Label: Antenna transmitting signal

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1309	42.3	15.9	8.5	27.6	42.3	5.2	0.5	39.4	45.1
Italy	1129	41.0	14.8	9.0	26.4	41.0	8.2	0.6	39.0	42.7
Lebanon	375	39.0	15.5	13.6	23.6	39.0	5.4	2.8	42.6	36.7
Norway	818	44.6	11.1	6.7	32.6	44.6	4.9	0.1	36.7	47.9
Portugal	613	45.2	13.1	11.6	27.5	45.2	2.2	0.4	36.0	48.0
Russian Federation	1277	53.6	16.7	7.8	20.0	53.6	1.6	0.3	52.2	54.5
Slovenia	369	40.3	15.2	3.8	38.9	40.3	1.5	0.3	37.7	41.4
Sweden	1243	29.6	12.7	13.7	37.5	29.6	5.9	0.6	28.5	30.4
United States	979	35.5	17.9	9.6	33.5	35.5	3.4	0.0	33.2	37.0
International Avg (n=9)	8112	41.2	14.8	9.4	29.7	41.2	4.3	0.6	38.4	42.6

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P7\_05A (PA33028A): Electricity & Magnetism / Applying Type: CR 2 Points  
Label: Electric force on charged dust

COUNTRY	N	20 %	10 %	11 %	79 %	OMITTED %	NOT REACHED %	V1 %	V2 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1309	8.5	1.7	4.6	34.1	50.3	0.7	14.9	8.5	9.6	7.5
Italy	1128	21.4	1.5	6.3	18.7	51.5	0.6	29.2	21.4	21.1	21.7
Lebanon	382	4.6	3.9	1.1	30.8	56.6	3.0	9.6	4.6	4.8	4.4
Norway	818	24.5	7.8	3.1	60.3	4.1	0.1	35.4	24.5	23.1	25.1
Portugal	613	20.7	2.3	3.5	29.3	43.6	0.6	26.5	20.7	22.6	20.1
Russian Federation	1277	28.7	6.2	5.4	19.8	39.6	0.3	40.3	28.7	27.2	29.8
Slovenia	368	35.7	2.6	6.6	35.9	19.0	0.3	44.8	35.7	42.0	32.9
Sweden	1243	30.9	0.6	5.7	27.1	34.8	0.8	37.3	30.9	34.3	28.7
United States	979	10.6	4.5	2.2	57.2	25.4	0.1	17.3	10.6	7.6	12.5
International Avg (n=9)	8117	20.6	3.5	4.3	34.8	36.1	0.7	28.4	20.6	21.4	20.3

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P7\_05B (PA33028B): Electricity & Magnetism / Knowing Type: MC Key: C  
Label: Path of charged dust particle

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1309	51.4	12.4	11.0	51.4	21.2	3.2	0.8	45.3	57.1
Italy	1129	39.0	10.3	9.8	39.0	19.0	21.0	0.9	31.3	45.5
Lebanon	345	31.9	11.0	27.3	31.9	13.8	13.0	3.1	32.6	31.5
Norway	818	74.6	7.0	6.1	74.6	7.9	4.1	0.4	74.3	74.8
Portugal	613	63.0	10.8	9.1	63.0	14.8	1.5	0.7	68.9	61.3
Russian Federation	1277	60.9	9.5	9.3	60.9	12.4	7.4	0.4	61.4	60.6
Slovenia	369	68.5	8.5	5.2	68.5	15.2	2.3	0.3	62.5	71.2
Sweden	1243	61.8	10.2	9.0	61.8	13.8	4.2	1.0	56.2	65.6
United States	979	52.6	8.1	14.5	52.6	20.8	4.0	0.1	39.9	60.8
International Avg (n=9)	8082	56.0	9.8	11.2	56.0	15.4	6.7	0.9	52.5	58.7

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P7\_06A (PA33054A): Electricity & Magnetism / Knowing Type: MC Key: C  
Label: Induced emf changes in polarity

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1309	19.2	31.3	18.7	19.2	24.0	5.9	0.8	17.2	21.1
Italy	1129	41.3	14.1	9.3	41.3	19.6	14.8	0.9	40.4	42.0
Lebanon	368	43.0	16.2	9.6	43.0	18.8	9.7	2.9	48.1	39.6
Norway	818	35.7	12.5	19.0	35.7	29.0	3.4	0.4	32.6	37.1
Portugal	613	35.8	18.9	18.9	35.8	20.0	5.7	0.7	41.8	34.0
Russian Federation	1277	54.7	9.8	10.5	54.7	19.2	5.3	0.4	59.3	51.6
Slovenia	369	35.9	18.3	17.1	35.9	26.0	2.4	0.3	39.1	34.5
Sweden	1243	28.5	18.9	24.5	28.5	22.5	4.5	1.1	31.2	26.8
United States	979	27.7	21.8	22.3	27.7	22.8	5.2	0.1	21.5	31.8
International Avg (n=9)	8105	35.8	18.0	16.6	35.8	22.4	6.3	0.8	36.8	35.4

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P7\_06B (PA33054B): Electricity & Magnetism / Reasoning Type: CR 1 Point  
Label: Magnitude of peak emf

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1309	11.4	20.5	67.1	1.0	11.4	11.1	11.7
Italy	1129	5.8	19.0	73.8	1.4	5.8	3.9	7.5
Lebanon	382	6.9	28.5	61.3	3.3	6.9	4.7	8.3
Norway	818	29.5	32.6	37.4	0.5	29.5	17.6	34.4
Portugal	613	12.5	27.6	58.6	1.3	12.5	5.7	14.6
Russian Federation	1277	8.5	26.2	64.4	0.8	8.5	6.4	9.9
Slovenia	368	32.8	27.6	39.3	0.3	32.8	28.1	34.8
Sweden	1242	17.8	28.9	51.7	1.6	17.8	14.1	20.3
United States	979	13.4	55.4	30.8	0.5	13.4	10.3	15.3
International Avg (n=9)	8117	15.4	29.6	53.8	1.2	15.4	11.3	17.4

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P7\_07 (PA33040): Electricity & Magnetism / Reasoning      Type: MC      Key: B  
Label: Tube light near charged balloon

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1309	60.7	2.3	60.7	32.3	2.6	0.9	1.2	55.8	65.3
Italy	1129	55.0	3.9	55.0	28.6	7.2	3.7	1.7	53.2	56.5
Lebanon	370	48.0	5.5	48.0	29.4	9.8	3.4	3.9	49.5	46.9
Norway	818	52.1	1.5	52.1	22.7	22.3	0.8	0.6	52.4	52.0
Portugal	613	83.0	1.6	83.0	10.0	3.4	0.7	1.3	83.2	82.9
Russian Federation	1277	70.8	1.7	70.8	18.5	7.2	0.8	1.1	69.4	71.8
Slovenia	369	62.4	0.2	62.4	18.1	18.4	0.7	0.3	60.9	63.0
Sweden	1243	42.3	1.8	42.3	28.8	21.2	4.1	1.7	43.6	41.4
United States	979	44.2	2.6	44.2	30.3	19.8	2.7	0.5	35.9	49.5
International Avg (n=9)	8107	57.6	2.3	57.6	24.3	12.4	2.0	1.4	56.0	58.8

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P7\_08A (PA33095A): Wave Phenom. & Atomic/Nuclear / Applying Type: CR 1 Point  
Label: Speed of wave down a rope

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1309	59.5	21.5	17.6	1.4	59.5	62.4	56.8
Italy	1129	58.6	12.6	27.0	1.8	58.6	58.1	59.1
Lebanon	382	68.1	6.4	21.4	4.1	68.1	74.0	64.2
Norway	804	71.9	12.0	15.4	0.7	71.9	75.9	70.3
Portugal	613	79.1	11.8	7.8	1.4	79.1	82.3	78.2
Russian Federation	1277	74.1	10.2	14.6	1.2	74.1	74.7	73.7
Slovenia	368	82.5	9.6	7.6	0.3	82.5	90.8	78.8
Sweden	1243	69.8	13.2	14.9	2.1	69.8	72.5	68.1
United States	979	63.8	25.9	9.8	0.5	63.8	61.1	65.6
International Avg (n=9)	8104	69.7	13.7	15.1	1.5	69.7	72.4	68.3

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.



P7\_08B (PA33095B): Wave Phenom. & Atomic/Nuclear / Applying Type: MC Key: A  
Label: Speed of wave with heavier rope

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1309	44.3	44.3	25.6	20.0	6.7	1.3	2.1	40.4	48.0
Italy	1129	33.7	33.7	34.4	15.6	4.5	4.9	6.9	27.8	38.6
Lebanon	372	52.9	52.9	17.9	16.5	6.6	0.9	5.1	57.9	49.6
Norway	818	50.5	50.5	30.8	11.9	3.0	2.0	1.7	49.8	50.9
Portugal	613	41.1	41.1	32.7	19.7	3.8	1.3	1.5	40.1	41.4
Russian Federation	1277	43.2	43.2	31.0	16.0	4.3	2.6	2.8	44.0	42.7
Slovenia	369	68.7	68.7	16.1	10.8	2.8	0.9	0.7	64.9	70.3
Sweden	1243	56.9	56.9	21.6	13.6	4.0	1.2	2.7	54.8	58.4
United States	979	40.9	40.9	31.2	18.4	6.1	2.5	0.9	37.4	43.2
International Avg (n=9)	8109	48.0	48.0	26.8	15.8	4.6	2.0	2.7	46.3	49.2

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P8\_01A (PA33066A): Mechanics & Thermodynamics / Applying      Type: MC    Key: A  
Label: Net force on swinging ball

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1319	42.7	42.7	6.2	20.5	29.4	1.1	0.1	45.1	40.4
Italy	1135	39.4	39.4	13.0	25.6	19.3	2.6	0.0	40.9	38.1
Lebanon	387	37.0	37.0	8.8	23.6	27.2	3.4	0.0	38.2	36.3
Norway	821	66.5	66.5	1.7	13.7	16.3	1.8	0.0	74.2	63.0
Portugal	594	62.8	62.8	3.0	16.5	17.4	0.2	0.0	70.2	60.6
Russian Federation	1282	63.3	63.3	3.4	19.4	13.2	0.7	0.0	68.4	59.6
Slovenia	368	45.3	45.3	6.7	28.8	18.7	0.5	0.0	47.3	44.5
Sweden	1250	55.3	55.3	4.4	14.0	24.2	2.1	0.0	58.6	53.2
United States	983	49.3	49.3	3.7	16.6	28.9	1.5	0.0	52.2	47.5
International Avg (n=9)	8139	51.3	51.3	5.7	19.9	21.6	1.5	0.0	55.0	49.2

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P8\_01B (PA33066B): Mechanics & Thermodynamics / Knowing Type: MC Key: C  
Label: Direction of ball when released

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1319	54.2	5.2	9.3	54.2	30.8	0.4	0.1	41.9	65.9
Italy	1135	67.8	2.9	5.6	67.8	21.0	2.8	0.0	62.9	71.9
Lebanon	387	49.7	3.0	8.3	49.7	36.0	3.1	0.0	44.7	52.7
Norway	821	85.5	1.1	3.8	85.5	7.6	2.0	0.0	78.8	88.6
Portugal	594	77.0	3.6	4.6	77.0	14.5	0.4	0.0	61.6	81.6
Russian Federation	1282	73.3	1.4	6.4	73.3	18.7	0.2	0.0	70.9	75.1
Slovenia	368	78.3	1.4	6.5	78.3	13.3	0.5	0.0	65.8	83.8
Sweden	1250	85.4	1.6	3.3	85.4	8.8	0.8	0.0	79.5	89.3
United States	983	84.5	3.4	4.0	84.5	6.7	1.4	0.0	80.7	87.1
International Avg (n=9)	8139	72.9	2.6	5.8	72.9	17.5	1.3	0.0	65.2	77.3

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P8\_02 (PA33090): Mechanics & Thermodynamics / Reasoning Type: CR 2 Points  
Label: Accuracy of digital thermometer

COUNTRY	N	20 %	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	V2 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1319	7.6	30.9	39.4	22.1	0.1	38.5	7.6	4.6	10.4
Italy	1132	11.0	19.9	11.9	57.3	0.0	30.8	11.0	7.6	13.8
Lebanon	387	6.3	9.1	15.4	69.2	0.0	15.4	6.3	5.3	6.9
Norway	821	33.4	17.7	8.2	40.7	0.0	51.1	33.4	23.1	38.1
Portugal	594	14.8	21.2	23.1	40.9	0.0	36.0	14.8	7.5	17.0
Russian Federation	1282	26.6	14.6	24.6	34.3	0.0	41.2	26.6	23.7	28.7
Slovenia	367	44.6	12.7	15.2	27.6	0.0	57.2	44.6	35.0	48.8
Sweden	1248	27.9	22.4	17.2	32.4	0.0	50.3	27.9	24.9	29.8
United States	983	13.7	31.4	34.0	20.9	0.0	45.1	13.7	11.9	14.9
International Avg (n=9)	8133	20.6	20.0	21.0	38.4	0.0	40.6	20.6	16.0	23.2

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P8\_03A (PA33064A): Mechanics & Thermodynamics / Applying Type: CR 1 Point  
Label: Normal force on mass in cylinder

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1319	31.2	44.0	24.7	0.1	31.2	33.6	28.8
Italy	1135	41.2	32.9	25.8	0.0	41.2	40.9	41.5
Lebanon	387	30.3	43.7	25.1	0.8	30.3	33.2	28.6
Norway	821	48.2	42.5	9.3	0.0	48.2	42.7	50.7
Portugal	594	53.5	38.4	8.2	0.0	53.5	57.8	52.2
Russian Federation	1282	49.8	30.3	19.9	0.0	49.8	46.8	51.9
Slovenia	367	51.1	42.1	6.7	0.0	51.1	56.8	48.6
Sweden	1250	49.5	36.2	14.3	0.0	49.5	53.3	47.0
United States	983	41.7	52.1	6.2	0.0	41.7	40.8	42.3
International Avg (n=9)	8138	44.1	40.3	15.6	0.1	44.1	45.1	43.5

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P8\_03B (PA33064B): Mechanics & Thermodynamics / Applying      Type: CR    2 Points  
Label: Speed of block in trajectory

COUNTRY	N	20 %	10 %	11 %	79 %	OMITTED %	NOT REACHED %	V1 %	V2 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1319	1.2	0.8	1.6	37.6	58.8	0.1	3.5	1.2	1.0	1.4
Italy	1135	1.5	0.3	2.6	34.5	61.1	0.0	4.4	1.5	0.8	2.1
Lebanon	387	15.4	4.5	6.7	36.2	36.4	0.8	26.6	15.4	15.4	15.5
Norway	821	17.0	1.0	7.3	43.4	31.3	0.0	25.3	17.0	16.2	17.4
Portugal	594	14.4	2.8	13.7	36.5	32.7	0.0	30.8	14.4	20.0	12.7
Russian Federation	1282	13.1	3.8	3.8	37.1	42.1	0.0	20.8	13.1	10.9	14.8
Slovenia	367	14.0	2.3	5.7	52.0	25.9	0.0	22.1	14.0	15.1	13.5
Sweden	1247	9.6	0.5	5.0	48.1	36.8	0.0	15.1	9.6	8.6	10.3
United States	983	8.9	1.6	7.4	59.6	22.4	0.0	17.9	8.9	6.2	10.7
International Avg (n=9)	8135	10.6	1.9	6.0	42.8	38.6	0.1	18.5	10.6	10.5	10.9

V1 = Percent scoring 1 pt or better;    V2 = Percent scoring 2 pts;    Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P8\_04 (PA33110): Electricity & Magnetism / Knowing Type: MC Key: B  
Label: Magnet falls through coil

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1319	68.7	11.5	68.7	12.8	4.8	2.2	0.1	66.8	70.5
Italy	1135	65.9	7.7	65.9	14.4	7.3	4.7	0.0	63.3	68.1
Lebanon	387	61.9	13.4	61.9	16.5	2.9	4.5	0.8	57.6	64.5
Norway	821	66.3	3.0	66.3	26.5	1.3	2.9	0.0	65.1	66.9
Portugal	594	78.9	10.4	78.9	9.0	1.1	0.6	0.0	77.6	79.3
Russian Federation	1282	79.9	4.5	79.9	11.7	2.7	1.2	0.0	80.2	79.8
Slovenia	368	77.0	4.5	77.0	14.6	3.1	0.8	0.0	73.6	78.5
Sweden	1250	67.2	6.4	67.2	17.6	3.7	5.2	0.0	67.8	66.8
United States	983	70.7	6.1	70.7	16.3	5.0	1.9	0.0	66.1	73.8
International Avg (n=9)	8139	70.7	7.5	70.7	15.5	3.5	2.6	0.1	68.7	72.0

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P8\_05 (PA33118): Electricity & Magnetism / Reasoning      Type: MC      Key: D  
Label: Predict the pole of an electromagnet

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1319	38.9	15.4	27.9	16.6	38.9	0.8	0.3	38.4	39.5
Italy	1135	33.5	14.0	26.1	21.9	33.5	4.5	0.1	30.3	36.2
Lebanon	387	48.7	6.1	33.2	8.6	48.7	2.5	0.8	50.9	47.4
Norway	821	48.3	13.8	24.6	11.8	48.3	1.5	0.0	47.7	48.5
Portugal	594	43.1	17.0	23.5	15.7	43.1	0.7	0.0	46.3	42.2
Russian Federation	1282	55.2	8.0	27.1	8.5	55.2	1.2	0.0	53.3	56.7
Slovenia	368	46.7	9.9	29.7	12.7	46.7	1.0	0.0	47.8	46.2
Sweden	1250	44.2	14.6	24.7	14.7	44.2	1.8	0.0	43.4	44.7
United States	983	35.7	12.9	25.9	23.7	35.7	1.8	0.0	33.5	37.2
International Avg (n=9)	8139	43.8	12.4	27.0	14.9	43.8	1.7	0.1	43.5	44.3

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.



P8\_06 (PA33109): Electricity & Magnetism / Reasoning      Type: MC      Key: A  
Label: Resistance of unknown in graph

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1319	30.1	30.1	14.8	23.4	29.8	1.7	0.3	25.5	34.4
Italy	1135	40.6	40.6	14.5	21.6	18.8	4.4	0.1	38.4	42.5
Lebanon	387	41.9	41.9	6.9	29.1	16.2	5.0	0.8	40.3	42.9
Norway	821	56.6	56.6	9.5	11.7	21.0	1.1	0.0	57.4	56.2
Portugal	594	62.6	62.6	11.7	10.1	14.3	1.4	0.0	64.1	62.1
Russian Federation	1282	56.0	56.0	8.1	25.6	9.4	0.9	0.0	56.3	55.7
Slovenia	368	62.0	62.0	7.9	14.5	14.9	0.7	0.0	63.9	61.1
Sweden	1250	46.0	46.0	10.7	22.0	18.3	3.0	0.0	46.7	45.5
United States	983	45.2	45.2	11.0	22.9	18.5	2.4	0.0	42.6	46.9
International Avg (n=9)	8139	49.0	49.0	10.6	20.1	17.9	2.3	0.1	48.4	49.7

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P8\_07 (PA33029): Wave Phenom. & Atomic/Nuclear / Applying Type: MC Key: D  
Label: Index of refraction of glass

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1319	32.7	22.2	21.7	17.3	32.7	5.8	0.3	31.3	34.1
Italy	1135	34.5	21.9	17.8	13.6	34.5	12.2	0.1	36.8	32.6
Lebanon	387	36.0	16.1	10.2	21.5	36.0	13.4	2.7	33.3	37.7
Norway	821	22.4	24.0	26.8	18.9	22.4	7.9	0.0	22.9	22.1
Portugal	594	59.3	13.6	17.6	7.9	59.3	1.6	0.0	58.5	59.5
Russian Federation	1282	46.2	23.5	12.4	15.5	46.2	2.3	0.0	47.4	45.3
Slovenia	368	57.6	23.9	8.5	7.1	57.6	2.8	0.0	64.5	54.6
Sweden	1250	45.6	21.2	14.6	14.1	45.6	4.4	0.1	51.0	42.2
United States	983	26.7	25.2	23.3	20.5	26.7	4.3	0.0	26.8	26.7
International Avg (n=9)	8139	40.1	21.3	17.0	15.2	40.1	6.1	0.3	41.4	39.4

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P8\_08 (PA33097): Wave Phenom. & Atomic/Nuclear / Knowing Type: CR 1 Point  
Label: Wavelength of graphed wave

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1319	67.1	27.2	5.4	0.3	67.1	62.3	71.7
Italy	1135	33.0	53.2	13.7	0.1	33.0	26.0	38.9
Lebanon	387	46.6	40.4	10.3	2.7	46.6	45.8	47.0
Norway	806	59.4	35.6	4.9	0.0	59.4	57.7	60.2
Portugal	594	72.8	24.7	2.5	0.0	72.8	67.7	74.4
Russian Federation	1282	55.1	40.8	4.0	0.0	55.1	54.4	55.7
Slovenia	366	76.2	22.8	1.0	0.0	76.2	73.1	77.6
Sweden	1250	54.4	42.8	2.7	0.1	54.4	53.0	55.3
United States	983	50.8	44.7	4.5	0.0	50.8	41.3	57.1
International Avg (n=9)	8122	57.3	36.9	5.5	0.3	57.3	53.5	59.8

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P8\_09 (PA33099): Wave Phenom. & Atomic/Nuclear / Knowing Type: MC Key: C  
Label: Order of photon energies

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1319	45.5	23.7	8.6	45.5	21.1	0.9	0.3	41.3	49.5
Italy	1135	43.1	18.1	9.0	43.1	25.5	4.3	0.1	38.8	46.7
Lebanon	387	31.6	22.7	11.6	31.6	26.1	5.3	2.7	34.2	30.1
Norway	821	61.8	15.4	2.4	61.8	19.9	0.7	0.0	51.6	66.3
Portugal	594	55.4	16.4	1.2	55.4	25.4	1.5	0.0	53.8	55.9
Russian Federation	1282	67.7	14.9	4.8	67.7	11.8	0.8	0.0	68.8	66.9
Slovenia	368	53.4	18.9	6.9	53.4	19.4	1.4	0.0	46.5	56.5
Sweden	1250	42.9	21.2	10.3	42.9	24.4	1.2	0.1	38.6	45.6
United States	983	55.4	18.2	4.2	55.4	20.0	2.2	0.0	47.7	60.4
International Avg (n=9)	8139	50.8	18.8	6.5	50.8	21.5	2.0	0.3	46.8	53.1

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P8\_10 (PA33008): Wave Phenom. & Atomic/Nuclear / Applying Type: CR 2 Points  
Label: Nuclear decay chain (DERIVED)

COUNTRY	N	20 %	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	V2 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1319	60.0	24.9	7.3	7.5	0.3	84.9	60.0	62.6	57.4
Italy	1135	10.4	8.4	12.9	67.7	0.6	18.8	10.4	9.5	11.2
Lebanon	387	67.3	15.4	3.9	10.7	2.7	82.7	67.3	72.6	64.0
Norway	821	44.6	37.2	12.6	5.6	0.0	81.8	44.6	47.2	43.4
Portugal	594	42.9	35.1	8.6	13.5	0.0	78.0	42.9	45.4	42.2
Russian Federation	1282	69.1	18.6	7.3	5.1	0.0	87.7	69.1	71.6	67.3
Slovenia	366	35.8	34.3	18.7	11.2	0.0	70.1	35.8	36.1	35.6
Sweden	1248	30.3	37.6	18.9	13.0	0.2	67.9	30.3	33.5	28.2
United States	983	29.2	26.2	27.8	16.8	0.0	55.4	29.2	29.0	29.3
International Avg (n=9)	8135	43.3	26.4	13.1	16.8	0.4	69.7	43.3	45.3	42.1

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P8\_10A (PA33008A): Wave Phenom. & Atomic/Nuclear / Applying Type: CR 1 Point  
 Label: Nuclear decay chain part 1

COUNTRY	N	10 %	70 %	71 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1319	77.7	2.0	8.8	2.6	8.6	0.3	77.7	78.2	77.2
Italy	1135	19.4	0.4	2.8	7.0	69.9	0.6	19.4	16.6	21.7
Lebanon	387	79.4	0.5	4.3	1.8	11.3	2.7	79.4	83.7	76.8
Norway	821	73.5	2.3	10.6	7.7	5.9	0.0	73.5	74.4	73.1
Portugal	594	71.8	2.1	7.1	3.9	15.2	0.0	71.8	73.2	71.4
Russian Federation	1282	81.2	1.6	7.9	2.9	6.4	0.0	81.2	79.6	82.4
Slovenia	366	67.4	2.2	12.0	5.5	12.9	0.0	67.4	64.0	68.9
Sweden	1248	65.3	0.9	13.0	5.7	14.9	0.2	65.3	67.7	63.6
United States	983	50.4	2.7	12.5	15.4	19.0	0.0	50.4	45.7	53.6
International Avg (n=9)	8135	65.1	1.6	8.8	5.8	18.2	0.4	65.1	64.8	65.4

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
 Because of missing gender information, some totals may appear inconsistent.

P8\_10B (PA33008B): Wave Phenom. & Atomic/Nuclear / Applying Type: CR 1 Point  
Label: Nuclear decay chain part 2

COUNTRY	N	10 %	70 %	71 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1319	71.7	15.5	1.5	2.8	8.2	0.3	71.7	74.9	68.7
Italy	1135	13.2	6.7	1.2	8.2	70.1	0.6	13.2	13.7	12.8
Lebanon	387	73.7	9.8	0.3	1.3	12.1	2.7	73.7	78.5	70.8
Norway	821	57.0	22.1	4.4	11.0	5.6	0.0	57.0	60.5	55.4
Portugal	594	54.1	24.2	2.9	4.1	14.7	0.0	54.1	59.9	52.4
Russian Federation	1282	81.1	10.3	1.3	1.4	5.9	0.0	81.1	86.0	77.5
Slovenia	366	45.9	29.8	1.5	7.2	15.6	0.0	45.9	46.5	45.6
Sweden	1250	39.7	27.7	3.6	13.0	15.8	0.2	39.7	45.1	36.2
United States	983	39.3	22.5	1.5	15.6	21.1	0.0	39.3	40.6	38.5
International Avg (n=9)	8137	52.9	18.7	2.0	7.2	18.8	0.4	52.9	56.2	50.9

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P8\_10C (PA33008C): Wave Phenom. & Atomic/Nuclear / Applying Type: CR 1 Point  
 Label: Nuclear decay chain part 3

COUNTRY	N	10 %	70 %	71 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1319	85.6	0.3	2.6	3.2	8.0	0.3	85.6	86.7	84.6
Italy	1135	19.4	0.2	1.0	9.4	69.5	0.6	19.4	16.8	21.7
Lebanon	387	82.1	0.7	0.2	1.1	13.2	2.7	82.1	86.5	79.5
Norway	821	88.4	0.8	2.5	2.6	5.8	0.0	88.4	88.0	88.6
Portugal	594	80.1	0.6	3.2	2.1	14.0	0.0	80.1	84.4	78.8
Russian Federation	1282	87.2	0.9	1.7	4.2	6.0	0.0	87.2	89.2	85.7
Slovenia	366	77.5	0.5	5.0	4.2	12.9	0.0	77.5	74.5	78.8
Sweden	1250	74.6	1.5	3.1	5.5	15.1	0.2	74.6	78.2	72.3
United States	983	60.8	0.8	3.0	15.9	19.4	0.0	60.8	61.7	60.2
International Avg (n=9)	8137	72.9	0.7	2.5	5.3	18.2	0.4	72.9	74.0	72.2

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
 Because of missing gender information, some totals may appear inconsistent.



P9\_02 (PA33072): Mechanics & Thermodynamics / Applying Type: CR 1 Point  
Label: Work by sliding block

COUNTRY	N	10 %	11 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1326	12.2	39.3	15.3	32.7	0.4	51.6	51.1	51.9
Italy	1147	6.6	57.4	8.8	26.8	0.5	64.0	66.3	62.1
Lebanon	387	26.0	48.5	8.9	16.1	0.5	74.5	71.9	76.0
Norway	823	4.4	67.4	13.1	15.0	0.1	71.7	71.7	71.7
Portugal	580	37.7	35.1	13.2	13.0	0.9	72.9	75.2	72.2
Russian Federation	1276	12.6	0.0	75.9	11.1	0.3	12.6	12.4	12.9
Slovenia	368	2.0	83.7	9.1	4.7	0.6	85.6	83.7	86.4
Sweden	1252	0.4	57.3	21.2	20.8	0.3	57.8	55.4	59.4
United States	968	3.5	69.7	20.8	6.0	0.1	73.2	69.7	75.4
International Avg (n=9)	8127	11.7	50.9	20.7	16.2	0.4	62.6	61.9	63.1

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P9\_03 (PA33063): Mechanics & Thermodynamics / Reasoning Type: MC Key: B  
Label: Estimate elevator acceleration

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1326	43.1	20.2	43.1	11.3	21.6	3.3	0.5	37.5	48.0
Italy	1147	42.9	24.3	42.9	10.0	17.0	5.3	0.6	35.4	49.0
Lebanon	387	38.7	21.3	38.7	12.7	17.7	8.8	0.6	30.4	43.7
Norway	823	69.7	6.8	69.7	2.9	19.2	1.2	0.1	62.0	73.0
Portugal	580	46.1	24.2	46.1	12.4	15.5	0.9	0.9	34.8	49.3
Russian Federation	1276	75.5	11.1	75.5	3.5	9.0	0.6	0.3	70.4	79.2
Slovenia	368	65.4	16.4	65.4	4.7	11.9	1.1	0.6	53.6	70.1
Sweden	1252	59.1	13.7	59.1	6.5	18.6	1.8	0.3	52.5	63.3
United States	968	55.5	12.7	55.5	9.2	21.4	1.2	0.1	40.7	65.2
International Avg (n=9)	8127	55.1	16.7	55.1	8.1	16.9	2.7	0.5	46.4	60.1

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P9\_04 (PA33077): Mechanics & Thermodynamics / Applying Type: CR 2 Points  
Label: Car cylinder temperature

COUNTRY	N	20 %	10 %	11 %	79 %	OMITTED %	NOT REACHED %	V1 %	V2 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1326	5.6	2.9	0.7	35.7	54.5	0.6	9.3	5.6	5.6	5.7
Italy	1146	20.5	4.5	4.8	19.3	50.0	1.0	29.7	20.5	19.6	21.2
Lebanon	388	20.2	9.2	4.3	18.7	46.9	0.8	33.6	20.2	18.7	21.0
Norway	823	12.2	6.6	1.5	28.2	51.3	0.1	20.3	12.2	12.8	12.0
Portugal	580	27.5	3.4	3.2	22.3	42.6	0.9	34.1	27.5	27.3	27.6
Russian Federation	1276	46.8	10.6	4.5	11.9	25.9	0.3	61.9	46.8	45.3	47.9
Slovenia	368	61.7	5.6	8.4	15.1	8.6	0.6	75.7	61.7	58.5	62.9
Sweden	1251	28.9	3.3	4.2	29.2	34.1	0.3	36.4	28.9	29.6	28.4
United States	968	22.3	10.1	4.8	41.8	20.9	0.1	37.2	22.3	22.4	22.3
International Avg (n=9)	8126	27.3	6.3	4.0	24.7	37.2	0.5	37.6	27.3	26.6	27.7

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P9\_05A (PA331111A): Electricity & Magnetism / Applying      Type: CR    2 Points  
Label: Proton in magnetic field (magnitude)

COUNTRY	N	20 %	10 %	11 %	79 %	OMITTED %	NOT REACHED %	V1 %	V2 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1326	1.5	0.2	0.9	29.6	67.1	0.7	2.6	1.5	1.4	1.6
Italy	1146	25.6	5.2	13.7	17.7	36.0	1.9	44.5	25.6	28.3	23.4
Lebanon	387	14.7	2.0	6.8	28.1	47.1	1.3	23.5	14.7	15.2	14.4
Norway	823	49.8	4.6	11.4	11.3	22.3	0.6	65.8	49.8	56.5	46.9
Portugal	580	10.9	0.6	6.4	31.7	49.3	1.2	17.9	10.9	8.5	11.6
Russian Federation	1276	45.4	2.7	9.0	16.5	25.8	0.6	57.1	45.4	44.8	45.8
Slovenia	368	50.0	3.8	11.5	17.3	16.7	0.6	65.4	50.0	44.3	52.3
Sweden	1252	27.6	0.9	5.7	26.4	38.8	0.7	34.2	27.6	27.0	27.9
United States	968	14.5	1.9	7.1	53.2	23.2	0.2	23.5	14.5	14.3	14.7
International Avg (n=9)	8126	26.7	2.4	8.1	25.7	36.2	0.8	37.2	26.7	26.7	26.5

V1 = Percent scoring 1 pt or better;    V2 = Percent scoring 2 pts;    Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P9\_05B (PA33111B): Electricity & Magnetism / Reasoning      Type: MC      Key: A  
Label: Proton in magnetic field (direction)

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	.	.	.	.	.	.	.	.	.	.
Italy	1147	48.3	48.3	23.3	8.6	3.6	14.3	2.0	46.7	49.7
Lebanon	388	35.1	35.1	27.3	11.2	6.4	18.4	1.7	40.4	31.9
Norway	823	68.3	68.3	19.4	3.8	3.1	4.9	0.6	69.4	67.9
Portugal	580	25.6	25.6	15.2	39.3	11.9	6.7	1.3	21.9	26.7
Russian Federation	1276	55.6	55.6	21.6	8.4	5.2	8.4	0.7	58.1	53.8
Slovenia	368	53.3	53.3	33.7	4.2	3.9	4.4	0.6	56.6	51.9
Sweden	1252	44.6	44.6	33.8	10.0	5.6	5.0	0.9	46.1	43.6
United States	968	33.6	33.6	21.5	29.1	11.2	4.4	0.2	28.6	36.9
International Avg (n=8)	6802	45.6	45.6	24.5	14.3	6.4	8.3	1.0	46.0	45.3

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P9\_06 (PA33003): Electricity & Magnetism / Reasoning      Type: MC      Key: C  
Label: Shaking flashlight to light

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1326	69.0	13.9	4.8	69.0	9.8	1.6	0.8	61.2	76.0
Italy	1147	76.8	5.5	3.8	76.8	7.7	4.2	2.0	75.1	78.1
Lebanon	388	66.5	5.8	7.5	66.5	10.7	7.5	1.9	65.7	67.0
Norway	823	89.8	1.5	1.3	89.8	4.9	1.8	0.7	89.7	89.8
Portugal	580	91.0	3.1	0.8	91.0	3.1	0.7	1.3	88.5	91.7
Russian Federation	1276	88.7	2.4	2.3	88.7	4.4	1.6	0.7	83.6	92.4
Slovenia	368	78.7	3.4	2.4	78.7	13.5	1.5	0.6	65.6	83.9
Sweden	1252	78.6	4.4	2.9	78.6	9.8	3.3	0.9	76.7	80.0
United States	968	73.4	12.3	4.2	73.4	8.9	0.9	0.2	65.7	78.5
International Avg (n=9)	8128	79.2	5.8	3.3	79.2	8.1	2.6	1.0	74.6	81.9

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P9\_07 (PA33081): Wave Phenom. & Atomic/Nuclear / Knowing      Type: MC      Key: D  
Label: Light passes from air to water

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1326	22.6	28.7	14.1	33.0	22.6	0.6	1.0	20.5	24.5
Italy	1147	30.3	33.7	8.0	21.2	30.3	4.2	2.7	30.3	30.2
Lebanon	388	57.3	18.3	8.1	10.0	57.3	4.3	2.1	60.5	55.3
Norway	823	34.3	25.3	12.5	26.5	34.3	0.7	0.8	30.3	36.0
Portugal	580	41.7	30.3	5.5	20.5	41.7	0.8	1.3	43.2	41.3
Russian Federation	1276	60.2	20.6	4.2	13.1	60.2	0.8	1.1	58.4	61.5
Slovenia	368	58.9	12.4	6.6	19.6	58.9	1.3	1.1	54.1	60.8
Sweden	1252	47.5	19.1	7.1	21.6	47.5	3.3	1.5	49.0	46.5
United States	968	34.1	29.0	5.6	30.5	34.1	0.6	0.2	32.3	35.3
International Avg (n=9)	8128	43.0	24.1	8.0	21.8	43.0	1.8	1.3	42.1	43.5

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P9\_08 (PA33045): Wave Phenom. & Atomic/Nuclear / Reasoning Type: MC Key: D  
Label: Different patterns of particles

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1326	72.0	13.6	7.5	3.4	72.0	2.4	1.2	74.1	70.1
Italy	1147	57.3	11.6	10.6	7.8	57.3	9.5	3.1	55.7	58.6
Lebanon	387	58.5	11.2	10.9	5.4	58.5	11.9	2.1	58.0	58.8
Norway	823	65.5	12.9	7.1	11.7	65.5	2.0	0.8	73.6	62.1
Portugal	580	41.9	19.8	15.0	12.8	41.9	9.2	1.3	38.3	43.0
Russian Federation	1276	51.2	21.8	11.3	12.2	51.2	2.2	1.2	50.0	52.1
Slovenia	368	73.9	10.2	8.9	2.6	73.9	3.3	1.1	76.0	73.0
Sweden	1252	61.4	11.2	10.2	12.1	61.4	3.5	1.5	64.7	59.3
United States	968	46.9	15.5	18.5	17.4	46.9	1.5	0.2	47.0	46.9
International Avg (n=9)	8127	58.8	14.2	11.1	9.5	58.8	5.1	1.4	59.7	58.2

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.



P9\_09A (PA33094A): Wave Phenom. & Atomic/Nuclear / Reasoning      Type: CR    1 Point  
Label: Reactant pair for nuclear fusion

COUNTRY	N	10 %	79 %	OMITTED %	NOT REACHED %	V1 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1326	46.9	48.7	2.7	1.6	46.9	45.9	47.8
Italy	1147	20.1	56.4	17.5	6.0	20.1	17.2	22.4
Lebanon	388	22.9	52.8	20.2	4.1	22.9	23.8	22.3
Norway	823	28.7	66.8	3.2	1.3	28.7	23.1	31.0
Portugal	580	47.7	46.5	3.2	2.6	47.7	44.0	48.8
Russian Federation	1276	20.0	69.5	8.5	2.0	20.0	17.8	21.6
Slovenia	368	46.2	48.4	3.8	1.7	46.2	48.3	45.3
Sweden	1251	33.3	59.8	4.8	2.1	33.3	32.8	33.7
United States	968	41.3	55.3	3.1	0.2	41.3	33.4	46.6
International Avg (n=9)	8127	34.1	56.0	7.4	2.4	34.1	31.8	35.5

V1 = Percent scoring 1 pt or better;    V2 = Percent scoring 2 pts;    Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.

P9\_09B (PA33094B): Wave Phenom. & Atomic/Nuclear / Knowing      Type: MC      Key: C  
Label: Fusion energy production

COUNTRY	N	DIFF %	A %	B %	C %	D %	OMITTED %	NOT REACHED %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1326	45.2	4.5	29.3	45.2	13.1	4.7	3.2	40.5	49.4
Italy	1147	27.5	5.1	25.4	27.5	15.7	13.8	12.6	24.3	30.1
Lebanon	388	22.8	4.6	28.2	22.8	13.9	21.2	9.2	17.9	25.8
Norway	823	45.5	10.5	26.4	45.5	11.5	3.8	2.4	39.4	48.1
Portugal	580	45.0	12.9	24.7	45.0	10.0	3.3	4.1	40.8	46.2
Russian Federation	1276	47.8	5.6	19.7	47.8	10.7	10.1	6.2	47.5	48.0
Slovenia	368	53.2	5.5	28.5	53.2	7.3	2.7	2.8	48.7	54.9
Sweden	1252	46.7	8.2	27.6	46.7	9.4	4.6	3.4	44.8	48.0
United States	968	53.0	8.7	24.6	53.0	10.8	2.5	0.4	52.9	53.1
International Avg (n=9)	8128	43.0	7.3	26.0	43.0	11.4	7.4	4.9	39.6	44.8

DIFF = Percent correct  
Because of missing gender information, some totals may appear inconsistent.

P9\_09C (PA33094C): Wave Phenom. & Atomic/Nuclear / Applying Type: CR 2 Points  
Label: Loss of mass after fusion

COUNTRY	N	20 %	10 %	11 %	79 %	OMITTED %	NOT REACHED %	V1 %	V2 %	GIRL PCT RIGHT	BOY PCT RIGHT
France	1326	1.1	3.3	5.4	16.5	68.1	5.7	9.8	1.1	0.3	1.8
Italy	1147	2.0	0.6	4.7	9.2	68.3	15.3	7.2	2.0	1.4	2.5
Lebanon	388	10.4	2.0	10.6	17.9	43.8	15.4	22.9	10.4	10.8	10.1
Norway	823	15.9	0.9	15.8	15.2	48.7	3.5	32.6	15.9	13.4	17.0
Portugal	580	2.3	4.2	6.3	14.1	67.9	5.3	12.8	2.3	1.0	2.7
Russian Federation	1276	11.2	1.3	5.9	18.2	52.8	10.6	18.4	11.2	10.2	11.9
Slovenia	368	16.2	1.6	21.2	24.4	33.3	3.3	39.0	16.2	15.4	16.5
Sweden	1252	8.0	3.2	10.9	22.1	51.3	4.4	22.2	8.0	7.4	8.4
United States	968	2.5	2.5	9.3	50.6	33.7	1.5	14.3	2.5	2.1	2.8
International Avg (n=9)	8128	7.7	2.2	10.0	20.9	52.0	7.2	19.9	7.7	6.9	8.2

V1 = Percent scoring 1 pt or better; V2 = Percent scoring 2 pts; Percent right for boys and girls corresponds to percent obtaining full credit.  
Because of missing gender information, some totals may appear inconsistent.