

**Exhibit M4.5: Intended Areas of Study for Students Planning to Continue Their Education**

Reported by Advanced Mathematics Students

Students could indicate more than one area of study.

Country	Mathematics or Statistics		Physics		Engineering and Engineering Technologies		Computer and Information Sciences		Chemistry	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
France	15 (0.7)	520 (4.5)	14 (0.6)	512 (4.5)	23 (0.8)	499 (4.3)	12 (0.6)	490 (4.9)	11 (0.6)	485 (4.6)
Italy	9 (0.6)	473 (12.2)	6 (0.5)	514 (12.2)	25 (1.2)	467 (8.3)	7 (0.8)	429 (11.5)	8 (0.6)	445 (10.4)
Lebanon	23 (1.4)	529 (5.0)	18 (1.3)	531 (7.0)	75 (1.5)	539 (3.9)	12 (0.9)	530 (7.0)	5 (0.8)	525 (15.0)
Norway	31 (1.1)	491 (4.5)	33 (1.2)	494 (4.8)	68 (1.4)	466 (5.3)	23 (1.0)	466 (6.4)	15 (1.2)	477 (6.4)
Portugal	10 (0.6)	526 (4.2)	7 (0.6)	541 (6.2)	28 (1.3)	508 (3.7)	12 (0.8)	490 (7.0)	5 (0.5)	524 (6.6)
Russian Federation	28 (1.2)	529 (6.0)	28 (1.4)	520 (6.8)	27 (1.3)	511 (6.8)	24 (1.2)	519 (6.3)	9 (0.6)	498 (7.5)
Russian Federation 6hr+	41 (1.9)	575 (7.1)	36 (1.4)	572 (7.3)	34 (1.4)	562 (7.2)	32 (1.4)	573 (6.7)	7 (1.0)	539 (14.0)
Slovenia	6 (0.5)	528 (8.6)	5 (0.5)	523 (7.4)	14 (1.0)	485 (4.3)	8 (0.6)	486 (7.6)	7 (0.7)	500 (6.6)
Sweden	18 (0.9)	487 (4.9)	15 (0.9)	492 (5.9)	47 (0.9)	453 (4.3)	18 (1.1)	429 (5.8)	9 (0.5)	451 (8.0)
United States	26 (1.1)	512 (10.8)	15 (1.0)	525 (16.7)	28 (1.6)	523 (5.9)	17 (1.4)	502 (14.8)	14 (1.0)	524 (9.3)
International Avg.	18 (0.3)	511 (2.4)	16 (0.3)	517 (2.9)	37 (0.4)	494 (1.8)	15 (0.3)	482 (2.8)	9 (0.3)	492 (2.9)

SOURCE: IEA's Trends in International Mathematics and Science Study – TIMSS Advanced 2015

Country	Biological and Biomedical Sciences		Education		Business		Other	
	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement	Percent of Students	Average Achievement
France	40 (1.0)	449 (3.1)	7 (0.5)	452 (5.9)	14 (0.6)	458 (5.1)	30 (0.9)	448 (3.4)
Italy	33 (1.2)	440 (6.0)	12 (0.8)	414 (9.7)	13 (0.8)	444 (7.2)	38 (1.0)	406 (6.1)
Lebanon	5 (0.7)	535 (12.7)	2 (0.4)	~ ~	6 (0.9)	530 (14.0)	15 (1.1)	520 (5.5)
Norway	24 (0.9)	453 (5.3)	11 (0.7)	457 (5.7)	25 (1.8)	450 (5.1)	34 (1.1)	453 (4.4)
Portugal	38 (1.7)	494 (2.7)	3 (0.2)	441 (7.7)	26 (1.7)	467 (4.4)	30 (1.1)	461 (3.0)
Russian Federation	15 (0.8)	475 (8.4)	11 (0.6)	472 (9.4)	29 (0.9)	483 (6.8)	50 (1.0)	475 (5.8)
Russian Federation 6hr+	9 (0.9)	512 (19.2)	8 (0.6)	532 (10.6)	32 (1.5)	532 (7.8)	47 (1.4)	527 (8.0)
Slovenia	23 (1.2)	497 (5.7)	12 (0.8)	435 (4.4)	10 (0.8)	424 (7.1)	41 (1.3)	433 (3.8)
Sweden	32 (1.2)	424 (6.4)	6 (0.5)	433 (8.0)	16 (0.8)	416 (5.8)	32 (1.0)	411 (4.9)
United States	33 (1.2)	479 (6.1)	8 (0.6)	460 (7.9)	25 (1.4)	485 (6.0)	42 (1.5)	477 (6.0)
International Avg.	27 (0.4)	472 (2.3)	8 (0.2)	445 (2.7)	18 (0.4)	462 (2.5)	35 (0.4)	454 (1.6)

The Russian Federation 6hr+ results are for a subset of the Russian Federation students. This subset of students are in an Intensive stream that have at least 6 hours of mathematics lessons per week.

( ) Standard errors appear in parentheses. Because of rounding some results may appear inconsistent.

A tilde (~) indicates insufficient data to report achievement.