

Teacher workforce planning 2023 Exercise – October 2022 Statistical Model

The teacher workforce planning model estimates future student teacher intake numbers by rolling forward recent patterns in the school pupil and staff censuses and other data including national population projections.

The modelling described here uses the most recent data available i.e. the 2021 school pupil and staff censuses and the 2020 based national population projections. It is based on a set of assumptions - other assumptions would result in different estimates.

1. Teacher Targets – PfG and SGP agreement commitments

“Over the course of the Parliament, we will provide funding to support the recruitment of at least 3,500 teachers and 500 classroom assistants - over and above the 1,400 recruited during the pandemic”

[Programme for Government 2021-2022](#)

“We are investing in more teacher posts than there have been at any time since 2008. Teacher numbers increased from 53,400 in 2020 to 54,285 last year. Building on the almost 900 new teachers recruited last year, we will continue our plans to recruit an additional 3,500 teachers this parliamentary term.”

[Programme for Government 2022-2023](#)

The total number of teachers needed to meet the PfG/SGP agreement commitments is **57,100**, based on adding 3,500 to the estimated total number of teachers in place in November 2020 which was the last reference point before the Programme for Government 2021-2022.

At the time of the last teacher census in September 2021 there were 54,285 (FTE) teachers recorded, requiring an additional ~2,800 teachers by 2025 to meet the target.

2. Modelling approach

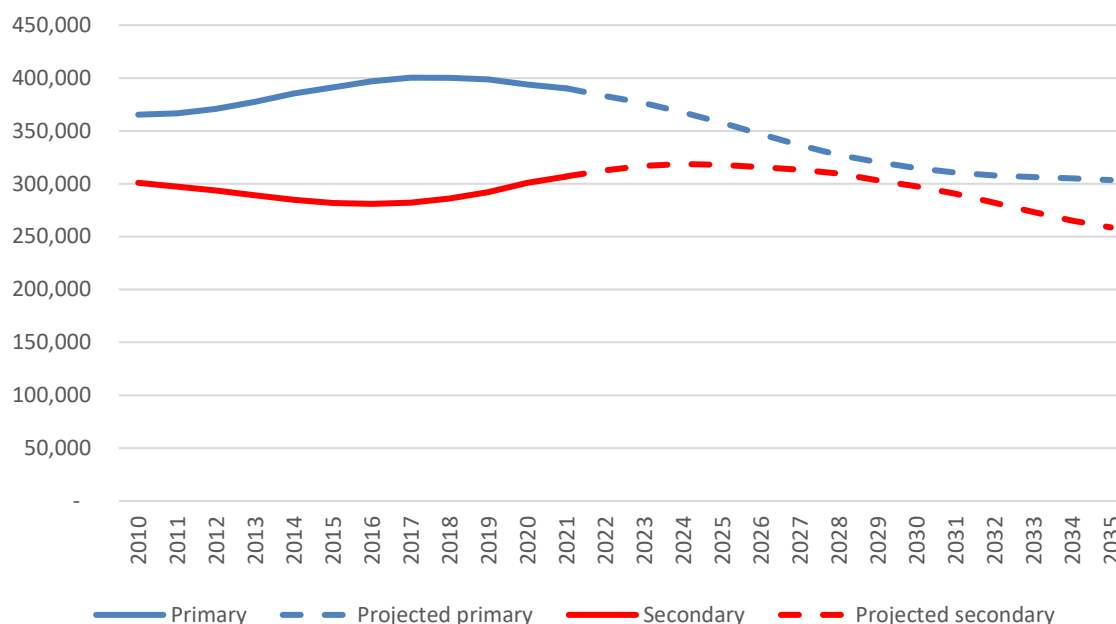
The workforce planning model has historically been based upon the assumption of maintaining pupil teacher ratios across each sector. With pupil numbers projected to fall overall by 2025, the modelled requirement for teachers would be 53,200 by 2025 if PTRs were matched to 2021 primary and secondary PTRs.

Instead of this approach, the statistical modelling has looked at the ITE students required to meet the PfG targets by 2025.

Model Inputs

2.1. Pupil projections

Chart 1: Pupil Projections, 2022-2035



The primary school roll has been falling since reaching a peak in 2017. Pupil projections based on population projections from National Records of Scotland show the number of primary pupils continuing to decrease through to 2035.

At secondary level, the pupil roll increased in 2017 for the first time in 14 years and is projected to continue increasing until 2024, after which it will fall below current levels by the end of the projection period in 2035.

These projections are based on the 2020 population projections which, following the recent fall in births, assume a lower birth rate than previous projections. Pupil projections based on cohorts that were not yet born are less reliable than projections for earlier years (beyond 2026 for Primary and 2032 for Secondary).

2.2. Teacher Numbers

In the past 5 years we have seen a large rise in teacher numbers of around 3,300 (a 7% increase). There have been increases across both the primary and secondary sectors. The 8% increase in primary teachers (compared to the 2% decrease in pupils) has meant that there are fewer pupils per teacher and consequently the primary pupil teacher ratio (PTR) has decreased to the lowest ever level. However, in secondary schools the number of pupils grew at a faster rate (9%) than the number of teachers (8%), meaning there were more pupils per teacher. The result of this is that the secondary PTR is now close to the highest level since 2004.

Table 1: Increase in teacher numbers 2016-2021

	Primary	Secondary	Total*
2016 - 2021	8%	8%	7%

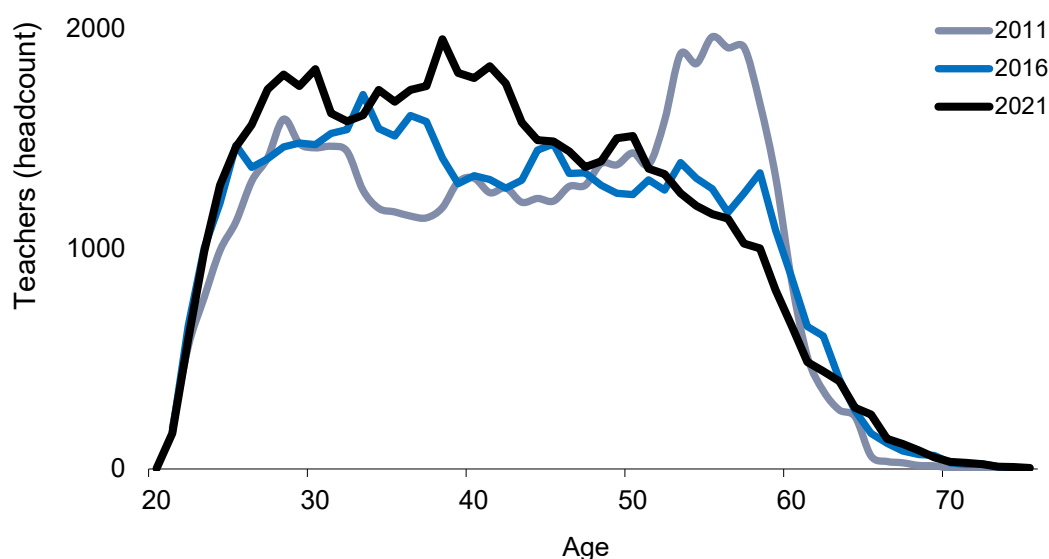
*Total change across this period to centrally employed teachers and ELC teachers, both of which have decreased.

Data source: [Teacher census supplementary statistics 2021](#)

2.3. Age profiles of teachers

The 2021 Teacher Census data shows that the age profile of teachers has changed much over the past 10 years. The prominent peak of teachers in their fifties, as seen in 2011, no longer exists. The largest group of teachers are now aged 25 to 40.

Chart 2: Age profile of school based teachers

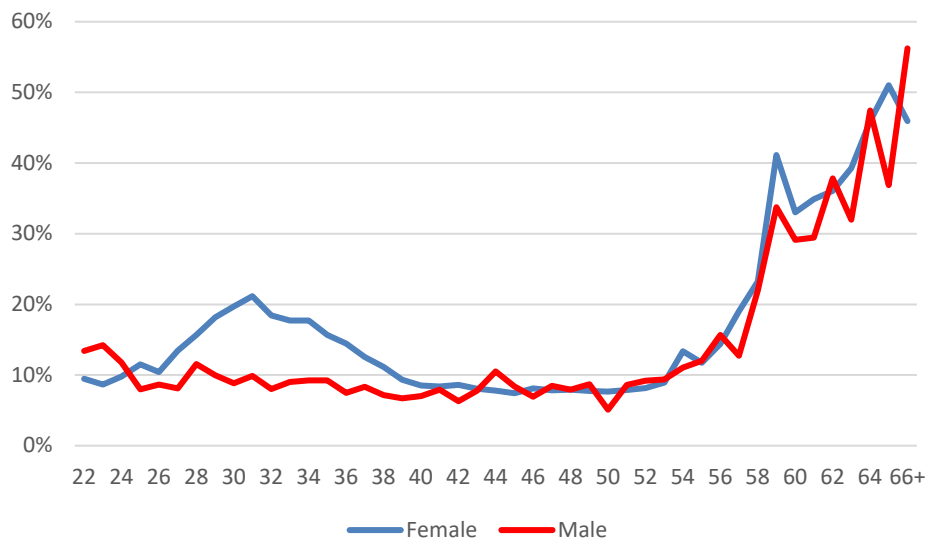


Data source: Teacher census supplementary statistics 2021

2.4. Wastage Rates (Excluding probationers)

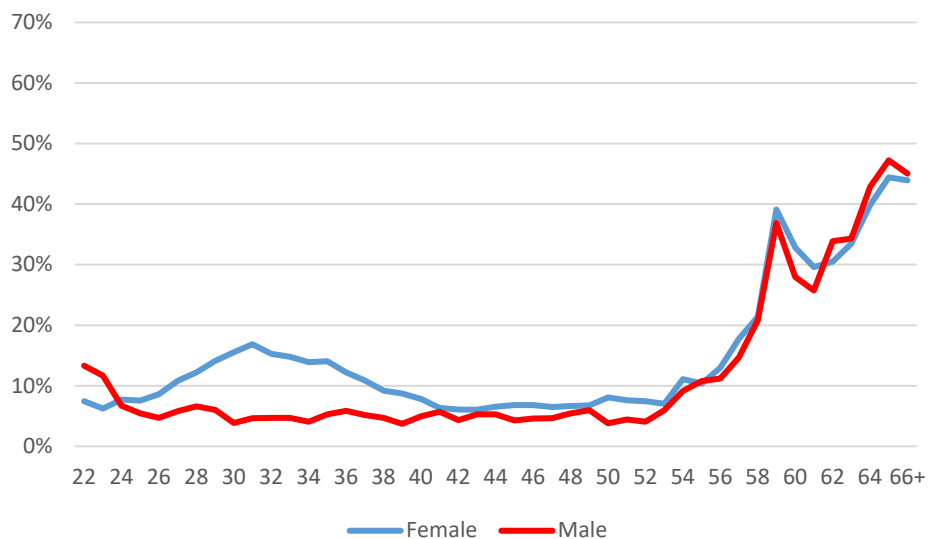
The wastage rates used in the modelling are based on an average of the past five years' figures. They represent the sum of all reductions in FTE as a proportion of total FTE. Higher rates for women under 40 include maternity leave, whilst higher rates for those from their late 50s reflect retirement (both full and partial).

Chart 3: Primary wastage rates (excluding TIS)



Total projected 2021 primary wastage – 3,500 FTE

Chart 4: Secondary wastage rates (excluding TIS)



Total projected 2021 secondary wastage – 2,600 FTE

2.5. Returners

The returner numbers used in the modelling are based on an average of five years' data. They represent the sum of all increases in FTE. Numbers are used instead of rates for returners since as we do not have details of the pool of non-working teachers in any year.

The average of the last five years' figures have been used for Primary (2,300) and secondary (1,800).

2.6. Teacher Induction Scheme (TIS) Wastage rates

Teacher Induction Scheme wastage rates are based on an average of the last 5 years of data. These rates calculate the percentage reduction in FTE of TIS teachers in the year following their probation year.

Primary – 21%

Secondary – 16%

2.7. Working patterns

There has been a steady increase in the proportion of teachers working part time over recent years up to 24.0% in 2019. This decreased slightly in 2020 to 23.4% but rebounded to 23.6% in 2021. The overall move to part time working has been accounted for in the model within the wastage and returners assumptions.

Table 2: Number of teachers (headcount) by mode of working, all sectors, 2017 - 2021

	Full-time	Part-time	Total headcount	Percentage part-time
2017	43,016	12,693	55,709	22.8
2018	43,198	13,265	56,463	23.5
2019	43,246	13,620	56,866	24.0
2020	44,387	13,564	57,951	23.4
2021				
<i>Primary</i>	20,669	8,615	29,284	29.4
<i>Secondary</i>	21,767	4,784	26,551	18.0
<i>Special</i>	1,636	605	2,241	27.0
<i>Centrally</i>				
<i>Employed</i>	696	584	1,280	45.6
Total	45,006	13,924	58,930	23.6

2.8. Retention rates

Retention rates (ITE students who go on to the Teacher Induction Scheme) vary between routes. Retention rates for primary undergraduate and PGDE courses are around 75% and 90% respectively. Rates for Secondary courses are around 60% (Undergraduate including combined degrees) and 80% (PGDE).

We measure retention rates as a proportion of those leaving university to those starting the teacher induction scheme. Probationers who chose the flexible route are not captured in these retention rates, but are captured in the model amongst the pool of 'returners'.

2.9. Supply pool

Supply pool teachers are not accounted for in the staff census which counts only the normal complement member of staff or normal complement replacements. Teachers moving from a teaching position which is counted in the census to a supply post will be accounted for in the wastage (leaver) rates. No additional provision for supply staff has been included. We expect that the current level of supply pool will be maintained by staff entering it from the normal complement of teachers (the on-roll population), accounted for by the wastage rates.

2.10. Vacancy data

In previous years, data on teacher vacancies has been collected in September at staff census time. This data is no longer collected and vacancies have not been accounted for in the model.

3. Routes to meeting the 2025 commitment (PGDE targets 2023-2024)

The Scottish Government commitment for additional teachers is to support the recruitment of at least 3,500 additional teachers over and above the 1,400 teachers recruited during the pandemic. This means a required increase of 2,900 teachers over the next 4 years from the 2021 census figures.

£145.5 million of funding for additional staff recruited during the pandemic has been baselined into the local government settlement from 2022/23 onwards. For modelling purposes we have assumed that this will fund 2,400 additional teachers (above 2019 levels), meaning an anticipated increase of around 400 teachers in 2022 compared to the 2021 total.

Meeting the 2025 target would require an average increase of around 850 in each of the remaining three years.

Table 3: Projected teachers

	All Teachers	Change in teacher numbers from previous year	% change in teacher numbers
2015	50,717		
2016	50,970	253	0.5%
2017	51,513	543	1.1%
2018	51,959	446	0.9%
2019	52,247	288	0.6%
2020	53,400	1,153	2.2%
2021	54,285	885	1.7%
2022	54,647	362	0.7%
2023	55,480	833	1.5%
2024	56,314	833	1.5%
2025	57,147	833	1.5%

For the purposes of modelling, these target increases have been split by sector broadly in line with existing relative split between primary and secondary ITE intakes. This split also allows for the increased need for teachers to meet the commitment to reduce class contact time.

Table 4: Projected teachers by sector

	Primary	Secondary	Special	Centrally Employed	ELC	Total
2021	25,800	24,800	2,000	1,000	700	54,300
2022	25,600	25,200	2,100	1,000	700	54,600
2023	25,800	25,800	2,100	1,000	700	55,500
2024	26,000	26,400	2,200	1,000	700	56,300
2025	26,200	27,000	2,300	1,000	700	57,100

The result of splitting the increase to teacher numbers across sectors in this way is a substantial reduction to the primary PTR (pupil teacher ratio) and a more modest lowering of the secondary PTR.

Table 5: Projected Pupil Teacher Ratios

	Primary	Secondary	Special
2021	15.1	12.4	3.8
2022	14.9	12.4	3.8
2023	14.6	12.3	3.8
2024	14.1	12.1	3.7
2025	13.7	11.8	3.6

Modelled PGDE targets 2022-2024

Using past trends of data on the proportion of teachers who leave and re-join each year, the teacher workforce planning model estimates that to meet these teacher targets the PGDE targets for primary and secondary should remain broadly in line with the targets which currently set.

Table 6: PGDE intake targets

	Primary PGDE	Secondary PGDE
2022	1,200	1,900
2023	1,200	1,900
2024	1,300	2,000

Teacher workforce planning 2023 Exercise – November 2023 Statistical Model

The teacher workforce planning model estimates future student teacher intake numbers by rolling forward recent patterns in the school pupil and staff censuses and other data including national population projections.

The modelling described here uses the most recent data available i.e. the 2022 school pupil and staff censuses and the 2020-based national population projections (updated by ONS in January 2023 to take account of higher inward migration than previously thought). It is based on a set of assumptions - other assumptions would result in different estimates.

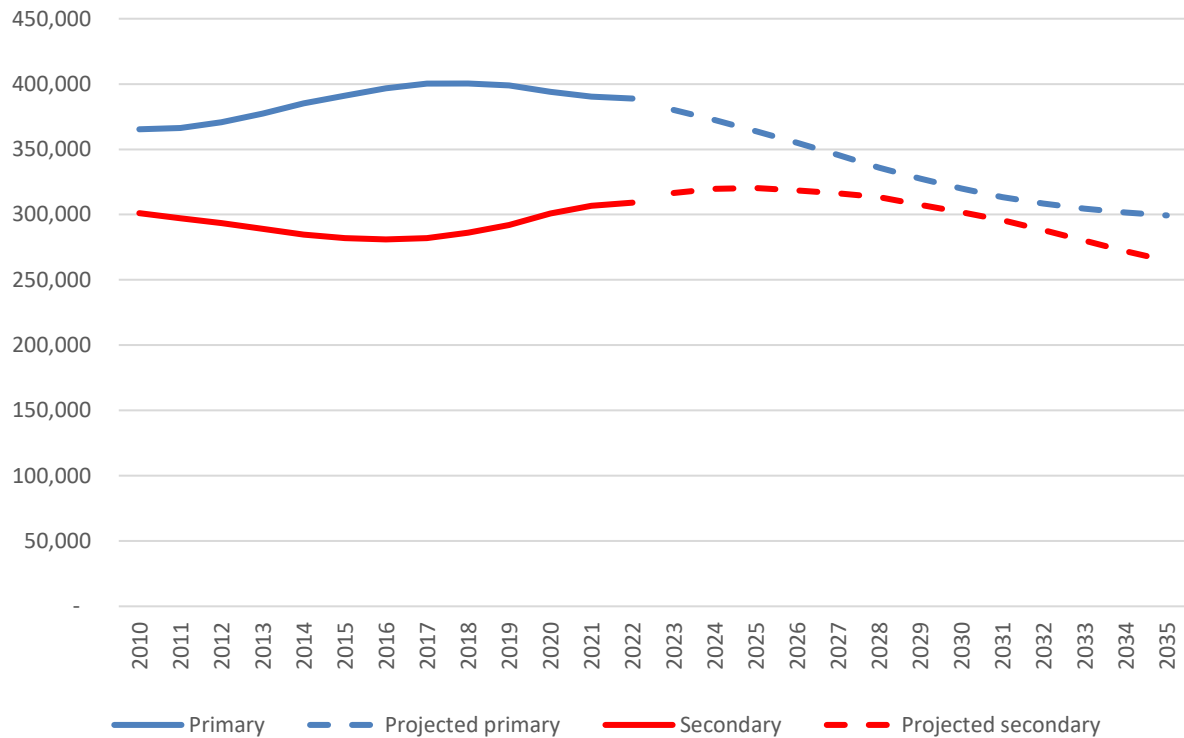
1. Modelling approach

The workforce planning model is based on the aim of calculating the initial teacher education (ITE) student intake required for maintaining the 2022 teacher numbers across each sector. With pupil numbers projected to fall overall by 2025, this will lead to a decrease in PTRs.

Model Inputs

1.1. Pupil projections

Chart 1: Pupil Projections, 2023-2035



The primary school roll has been falling since reaching a peak in 2017. Pupil projections based on population projections from National Records of Scotland show the number of primary pupils continuing to decrease through to 2035.

At secondary level, the pupil roll increased in 2017 for the first time in 14 years and is projected to continue increasing until 2024, after which it will fall below current levels by the end of the projection period in 2035.

These projections are based on the 2020 population projections which, following the recent fall in births, assume a lower birth rate than previous projections. An update to the 2020 population projections was published in January 2023 to account for higher than expected inward migration. This mainly affected young adult age groups with a lagged effect on school-aged children projections. Pupil projections based on cohorts that were not yet born are less reliable than projections for earlier years (beyond 2026 for Primary and 2032 for Secondary).

1.2. Teacher Numbers

In the past 5 years we have seen a rise in teacher numbers of nearly 2,700 (a 5% increase). There have been increases across both the primary and secondary sectors. The 4% increase in primary teachers (compared to the 3% decrease in pupils) has meant that there are fewer pupils per teacher and consequently the primary pupil teacher ratio (PTR) has decreased to the second lowest ever level (primary teacher numbers were higher in 2021 than in 2022). However, in secondary schools the number of pupils grew at a faster rate (10%) than the number of teachers (7%), meaning there were more pupils per teacher. The result of this is that the secondary PTR is now close to the highest level since 2004.

Table 1: Increase in teacher numbers 2017-2022

	Primary	Secondary	Total*
2017 - 2022	4%	7%	5%

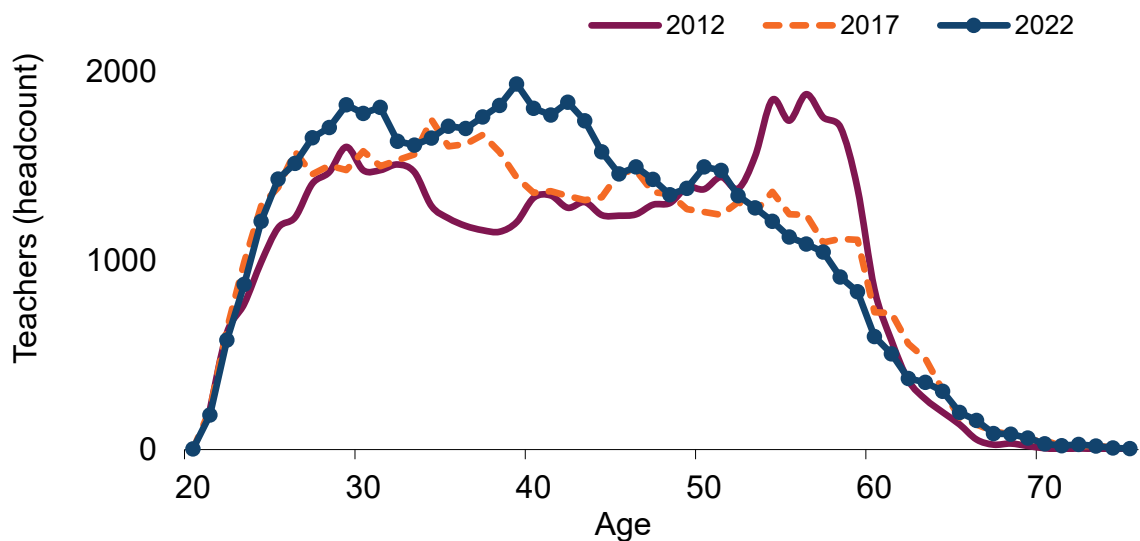
*Total change across this period includes centrally employed teachers and ELC teachers, both of which have decreased.

Data source: [Teacher census supplementary statistics 2022](#)

1.3. Age profiles of teachers

The 2022 Teacher Census data shows that the age profile of teachers has changed much over the past 10 years. The prominent peak of teachers in their mid to late-fifties, as seen in 2012, no longer exists. Teacher numbers are now relatively consistent from age 25 to 40 and slowly reduce in the older age groups.

Chart 2: Age profile of school based teachers

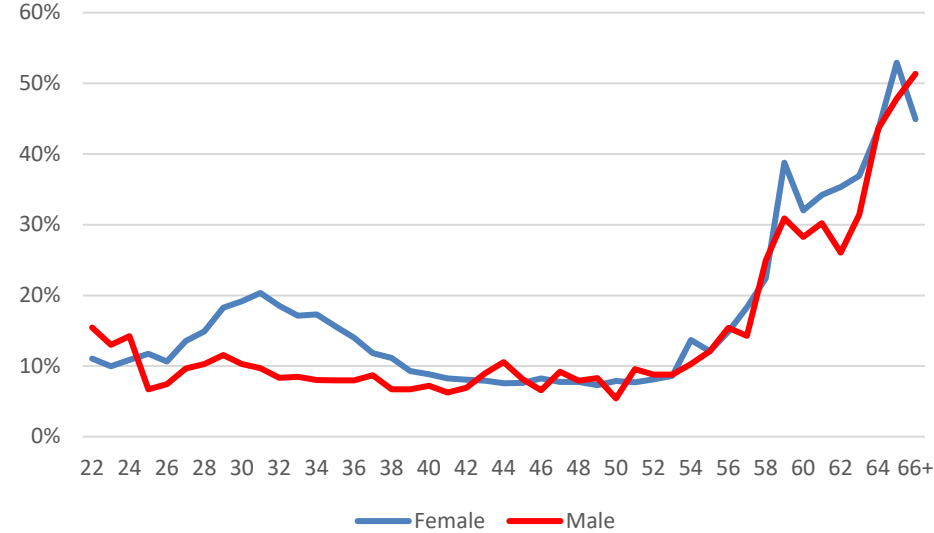


Data source: [Teacher census supplementary statistics 2022](#)

1.4. Wastage Rates (Excluding probationers)

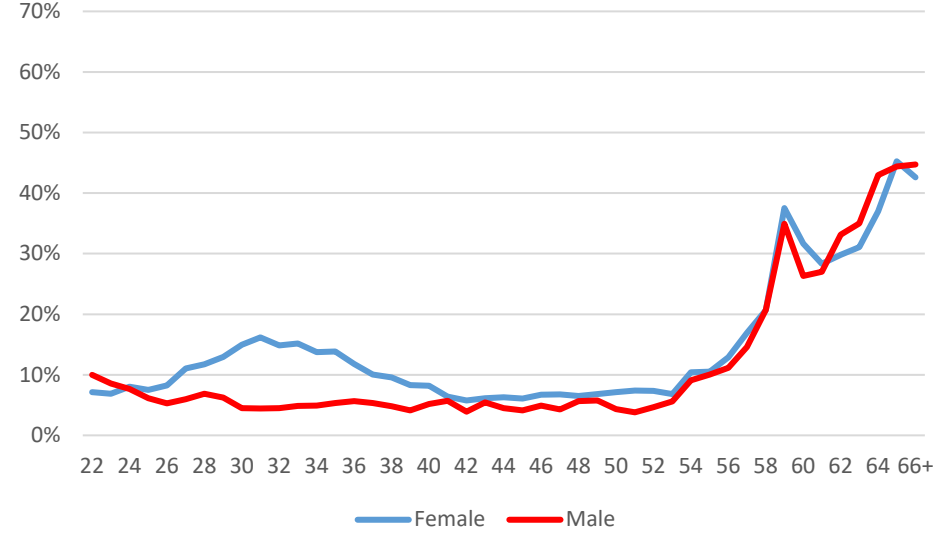
The wastage rates used in the modelling are based on an average of the past five years' figures. They represent the sum of all reductions in existing teacher FTE as a proportion of total teacher FTE. Higher rates for women under 40 include maternity leave, whilst higher rates for those from their late 50s reflect retirement (both full and partial).

Chart 3: Primary wastage rates (excluding TIS)



Total projected 2022 primary wastage – 3,400 FTE

Chart 4: Secondary wastage rates (excluding TIS)



Total projected 2022 secondary wastage – 2,600 FTE

1.5. Returners

The returner numbers used in the modelling are based on an average of five years' data. They represent the sum of all increases in FTE (this includes new teachers as well as teachers increasing their hours). Numbers are used instead of rates for returners since as we do not have details of the pool of non-working teachers in any year.

The average of the last five years' figures have been used for Primary (2,300) and secondary (1,800).

1.6. Working patterns

There has been a steady increase in the proportion of teachers working part time over recent years up to 24.0% in 2019. This decreased slightly in 2020 to 23.4% but rebounded to 24.5% in 2022. The overall move to part time working has been accounted for in the model within the wastage and returners assumptions.

Table 2: Number of teachers (headcount) by mode of working, all sectors, 2017 - 2022

	Full-time	Part-time	Total headcount	Percentage part-time
2017	43,016	12,693	55,709	22.8
2018	43,198	13,265	56,463	23.5
2019	43,246	13,620	56,866	24.0
2020	44,387	13,564	57,951	23.4
2021	45,006	13,924	58,930	23.6
2022				
<i>Primary</i>	19,926	9,113	29,039	31.4
<i>Secondary</i>	21,887	4,705	26,592	17.7
<i>Special</i>	1,704	656	2,360	27.8
<i>Centrally</i>				
<i>Employed</i>	747	585	1,332	43.9
Total	44,493	14,419	58,912	24.5

1.7. Teacher Induction Scheme (TIS) Wastage rates

Teacher Induction Scheme wastage rates are based on an average of the last 5 years of data. These rates calculate the percentage reduction in FTE of TIS teachers in the year following their probation year.

Primary – 27%

Secondary – 18%

1.8. Retention rates

Retention rates (ITE students who go on to the Teacher Induction Scheme) vary between the route used for ITE study. Retention rates for primary undergraduate and PGDE courses are around 75% and 90% respectively. Rates for Secondary courses are around 60% (Undergraduate including combined degrees) and 80% (PGDE).

We measure retention rates as a proportion of those leaving university to those starting the teacher induction scheme. Probationers who chose the flexible route are not captured in these retention rates, but are captured in the model amongst the pool of 'returners'.

1.9. Supply pool

Supply pool teachers are not accounted for in the staff census which counts only the normal complement member of staff or normal complement replacements. Teachers moving from a teaching position which is counted in the census to a supply post will be accounted for in the wastage (leaver) rates. No additional provision for supply staff has been included. We expect that the current level of supply pool will be maintained by staff entering it from the normal complement of teachers (the on-roll population), accounted for by the wastage rates.

1.10. Vacancy data

This data is no longer collected and vacancies have not been accounted for in the model.

2. Modelled option to maintain teacher numbers

This option models the requirement for ITE intakes with the objective of maintaining overall teacher numbers at the 2022 level.

Table 3: Projected teachers – maintaining teacher numbers

	All Teachers	Change in teacher numbers from previous year	% change in teacher numbers	Pupil:teacher ratio
2018	51,959	446	0.9%	13.6
2019	52,247	288	0.6%	13.6
2020	53,400	1,153	2.2%	13.3
2021	54,285	885	1.7%	13.2
2022	54,193	-92	-0.2%	13.2
2023	54,200	+7	0.0%	13.0
2024	54,200	0	0.0%	12.9
2025	54,200	0	0.0%	12.8
2026	54,200	0	0.0%	12.6

Table 4: Projected teachers by sector – maintaining teacher numbers

	Primary	Secondary	Special	Centrally Employed	ELC	Total
2023	25,500	24,900	2,100	1,000	700	54,200
2024	25,500	24,900	2,100	1,000	700	54,200
2025	25,500	24,900	2,100	1,000	700	54,200
2026	25,500	24,900	2,100	1,000	700	54,200

The result of keeping teacher numbers fixed is a reduction in primary and special school PTR (as primary and special school pupil numbers are projected to fall each year) and an increase in secondary PTR, until it falls in 2026 (after secondary pupil numbers peak in 2025).

Table 5: Projected Pupil Teacher Ratios – maintaining teacher numbers

	Primary	Secondary	Special
2022	15.3	12.4	3.7
2023	14.9	12.7	3.6
2024	14.6	12.9	3.6
2025	14.3	12.9	3.6
2026	14.0	12.8	3.5

Modelled PGDE targets 2023-2025

Using past trends of data on the proportion of teachers who leave and re-join each year, as described above, the teacher workforce planning model estimates that to maintain overall teacher numbers the PGDE requirements for primary and secondary should be as follows.

Table 6: PGDE intake requirements – maintaining teacher numbers (rounded to nearest hundred)

Academic year	Primary PGDE	Secondary PGDE
2023/24	1,000	1,000
2024/25	1,000	1,000
2025/26	1,000	1,000

The actual 2023/24 PGDE intake targets were set at 955 for primary and 2,000 for secondary, which translated into 2023 enrolments of 1,043 for primary and 1,002 for secondary. These figures are roughly in accordance with the current modelled option.

3. Conclusion

The workforce planning model suggests that to maintain teacher numbers at the 2022 level, around 1,000 students should embark on PGDE ITE for primary and 1,000 for secondary in Autumn 2024.

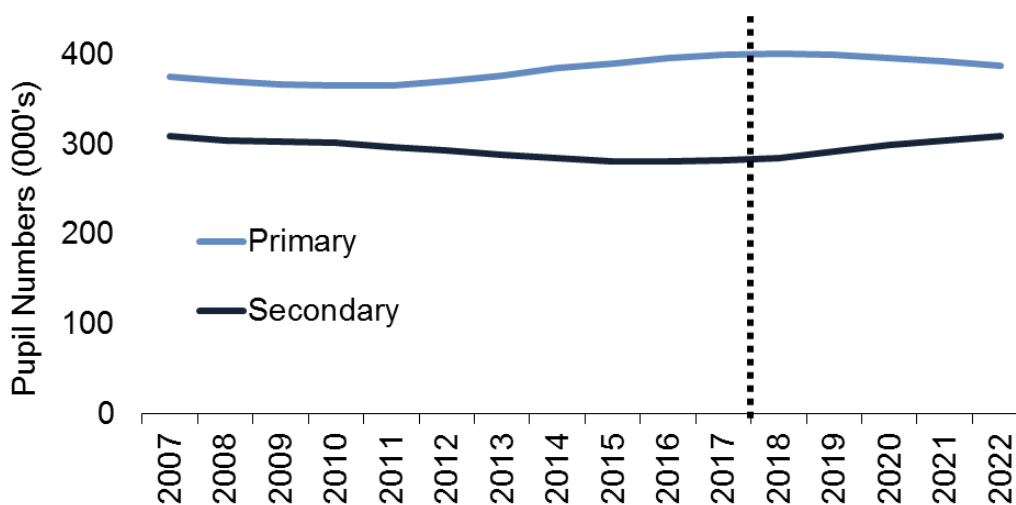
Teacher workforce planning 2017

The teacher workforce planning model estimates future student intake numbers by rolling forward recent patterns in census and other data and is based on a set of assumptions. Other assumptions would result in different estimates.

1. Model Inputs

1.1. Pupil projections

Pupil Projections, 2017-2022



The primary school roll has been rising over the last five years but is set to stabilise from 2018 onwards. At secondary, however, the pupil roll increased in 2017 for the first time in 14 years. This was largely due to the increased primary roll graduating onto secondary school and increases in staying on rates (both S4-S5 and S5-S6) in recent years.

Staying-on rates of secondary pupils, 2009 – 2017

	All pupils	
	S3-S5	S3-S6
2009	79.7%	49.2%
2010	82.9%	53.3%
2011	83.4%	55.6%
2012	84.9%	58.3%
2013	86.1%	60.3%
2014	87.2%	61.7%
2015	87.7%	62.7%
2016	87.3%	62.6%
2017	87.4%	62.2%

1.2. Pupil Census

The 2017 Pupil Census showed an increase of around 3,600 primary pupils and an increase of around 1,000 secondary pupils, compared to 2016.

1.3. Teacher Census

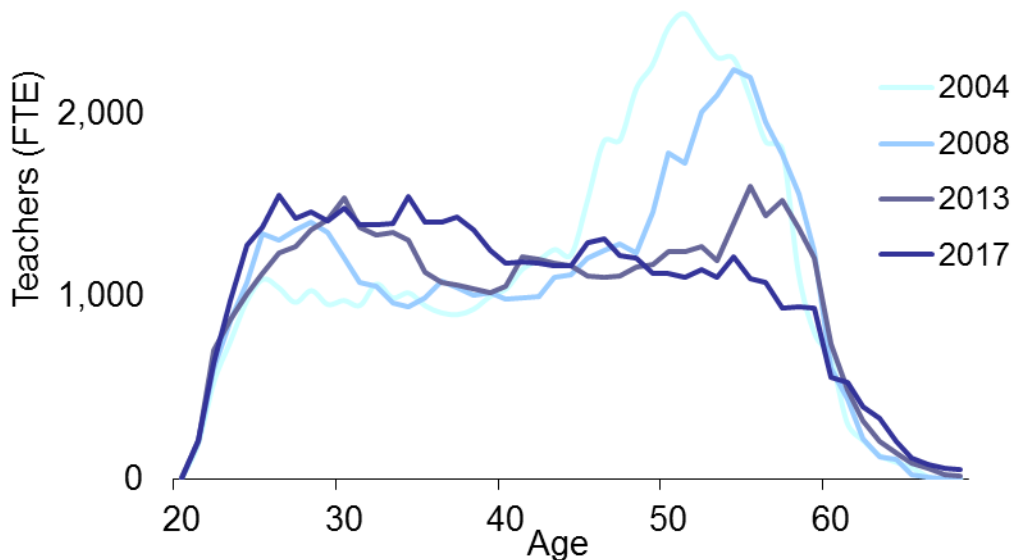
The 2017 Teacher Census reported an increase in primary teachers of 556 FTE and an increase in secondary teachers of 193 FTE. There was also small decreases in the number of special school teachers (-33), centrally employed (-110) and early learning and childcare teachers (-64).

Teacher Census figures include 666 Attainment Scotland Fund (ASF) funded posts. This demand for teachers in the sector is accounted for in this year's workforce planning process, as vacant posts due to ASF demands will have appeared in the vacancy figures which have been accounted for in the statistical model.

1.4. Age profiles of teachers

The 2017 Teacher Census data shows that the age profile of teachers has changed much over recent years. The prominent peak in the fifties, as seen in 2008, no longer exists and there is now a peak in the mid-thirties.

Age profile of school based teachers, 2010 to 2017



1.5. Working patterns

The percentage of teachers working part-time has been fluctuating slightly over the last nine years and increased by 1.2 percentage points from 21.2% in 2015 to 22.4% in 2016, the highest rate over this period. (Data on working patterns is not yet available for 2017)

Number of teachers (headcount) by mode of working, all sectors, 2010-2016

	Full-time	Part-time	Total headcount ⁽¹⁾	Part-time (%)
2010 ⁽¹⁾	43,660	10,767	54,427	19.8
2011 ⁽¹⁾	42,572	10,701	53,273	20.1
2012 ⁽¹⁾	42,497	10,568	53,065	19.9
2013	42,472	10,427	52,899	19.7
2014 ⁽³⁾	41,934	10,866	52,800	20.6
2015	41,884	11,256	53,140	21.2
2016				
Primary	19,770	7,263	27,033	26.9
Secondary	20,345	4,299	24,644	17.4
Special	1,575	528	2,103	25.1
Total	41,701	12,003	53,704	22.4

(1) Teachers are counted as full-time if their total FTE across all schools where they teach is greater or equal to one.

(2) Data on early learning and childcare, primary and total teachers along with associated pupil teacher ratios for 2010, 2011, 2012 were revised in 2013 to remove teachers who were double counted as a result of working in both sectors.

(3) 2014 Teacher figures were amended in February and December 2015. See background notes.

Excludes centrally employed and early learning and childcare teachers.

1.6. Vacancy data

The local authority vacancy collection in September showed that there were 309 pre-school/primary and 507 secondary full-time and part-time permanent vacancies as at 20th September 2017 (excluding head teachers and deputy head teachers).

The target student intake figures have been increased in line with these figures (accounting for drop out etc) on a one year basis for primary and a phased, more manageable, three year basis for secondary.

Increasing target student intakes is not a guarantee that vacancies will be filled.

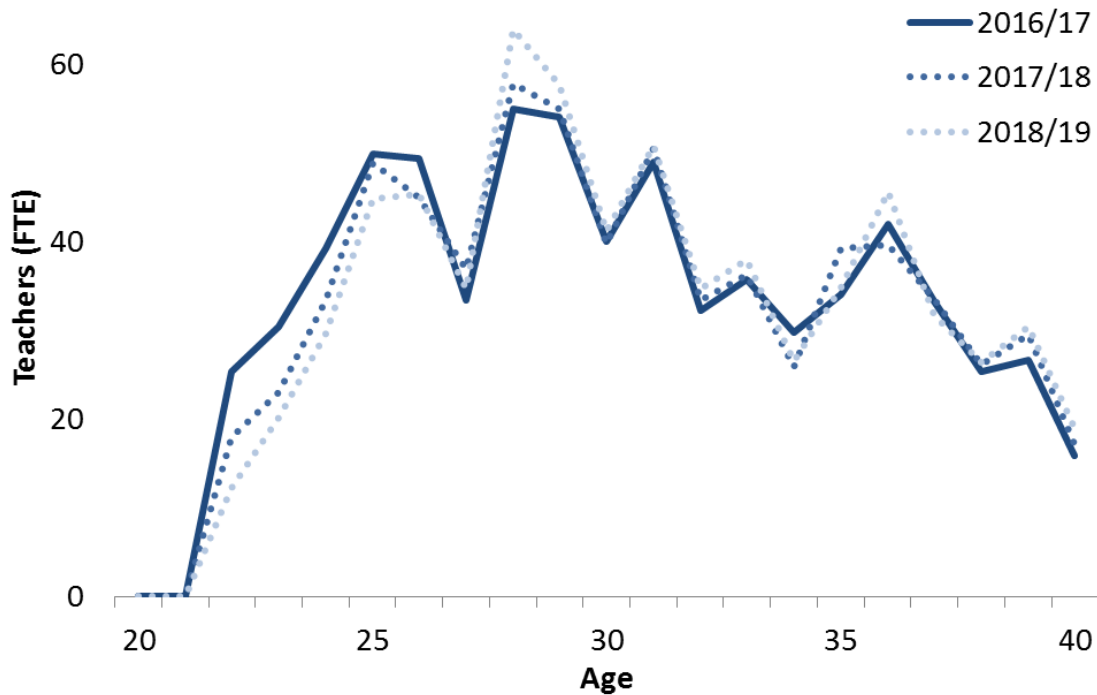
2. Assumptions

2.1. Leaver rates

Leaver rates are based on teachers in permanent employment only, as these are more stable and a more reliable measure of churn. Leavers include career breaks, retirements, teachers on maternity leave and any other long term or permanent move away from teaching. The percentage of permanent teachers "leaving" decreased from 6.4% in 2016 to 5.5% in 2017. Leaver rates for female teachers between the ages of 30-40 are broadly similar to 2016.

2.1.1. Maternity leave

The chart below shows the actual number of female leavers (aged 20-40) between 2016 and 2017, and the estimated future number of female leavers, on the basis that recent trends are forecast to continue.



2.2. Returner rates

Returner rates are also based on teachers in permanent employment. The average of the last three years figures in primary appeared to be skewed due to a higher than normal number between 2015 and 2016. Rather than assume that this high rate of returners would continue in future years, the previous approach of using 500 has been used. This approach errs on the side of caution rather than roll-forward possibly high returner rates and subsequently underestimate need. .

The average of the last three years figures has been used for Secondary (452).

2.3. Supply pool

The model accounts for the need of a pool of supply teachers and increases the student intake figure by 12% for this purpose. This is in line with the figure used last year.

2.4. PTRs

The model is based on the assumption of maintaining pupil teacher ratios, therefore it projects future teacher requirements in line with pupil projections on the basis of current PTRs.

The 2017 pupil and teacher census results show that the primary sector PTR has improved from 16.6 in 2016 to 16.4 in 2017, and the secondary PTR remained the same as 2015 at 12.2.

2.5 Retention rates

Retention rates (ITE students who go on to the Teacher Induction Scheme) vary between routes. Retention rates for Primary BEd and PGDE courses are around 75% and 85% respectively. Rates for Secondary courses are around 80% (BEd) and 90% (PGDE).

2.6 Post-probationer employment rates

The 2017 Teacher Census indicates that there has been an increase in the proportion of post-probationers in employment (permanent or temporary, full time or part-time). The figure has risen from 66% in 2011 to 88% in 2017, with the largest increase in the proportion of post-probationers with full-time permanent contracts (up from 13% in 2010 to 57% in 2017).

3. Model Results

The combination of the primary school pupil roll falling and the recent increase in primary teachers means that the model projects a lower requirement for new student teachers. Accounting for the pre-school and primary vacancies, the model projects that the 2018 intake target should be cut.

At secondary, the peak in school aged children over the past five years can be seen to be shifting from primary to secondary school. This is countered by a recent increase in the number of secondary school teachers. Hence the model suggests the intake target remains the same.

Vacancies for secondary have been smoothed across 2018, 2019 and 2020.

Primary and Secondary Student Intake Projections, 2018-2022

PRI vacancies accounted for in 2018 intake only

SEC vacancies accounted for across 2018-2020 intake

Entry Year	Primary		Secondary		Combined
	BEd	PGDE	BEd	PGDE	
2017 target intake	710	1,186	187	1,750	225
2017 actual intake	774	1,259	170	1,226	228
2018	700	700	185	1,700	195
2019	700	300	185	1,650	195
2020	700	250	185	1,450	195
2021	700	250	185	900	195
2022	700	500	185	700	195

Note: Primary estimates do not include any additional requirement for ELC sector.

The model outputs have been rounded to the nearest fifty.

TWPAG/2017/2

Primary and Secondary Teacher Projections, 2017-2023

Primary	Projected pupils (pre-school, primary and half of special)	Demand for teachers at start of academic year	Change in demand from previous year	Leavers during previous year	Vacancies arising during previous year	Teachers returning to profession in previous year	Projected Deficit at start of year
2017	493,430	26,443					
2018	491,651	26,528	86	1,435	1,368	500	868
2019	489,113	26,461	-67	1,404	1,232	500	1,042*
2020	484,474	26,289	-172	1,407	1,284	500	784
2021	481,038	26,167	-122	1,382	1,225	500	725
2022	476,928	26,010	-157	1,365	1,145	500	645
2023	473,749	25,790	-220	1,340	1,343	500	843

*includes 274 vacancies

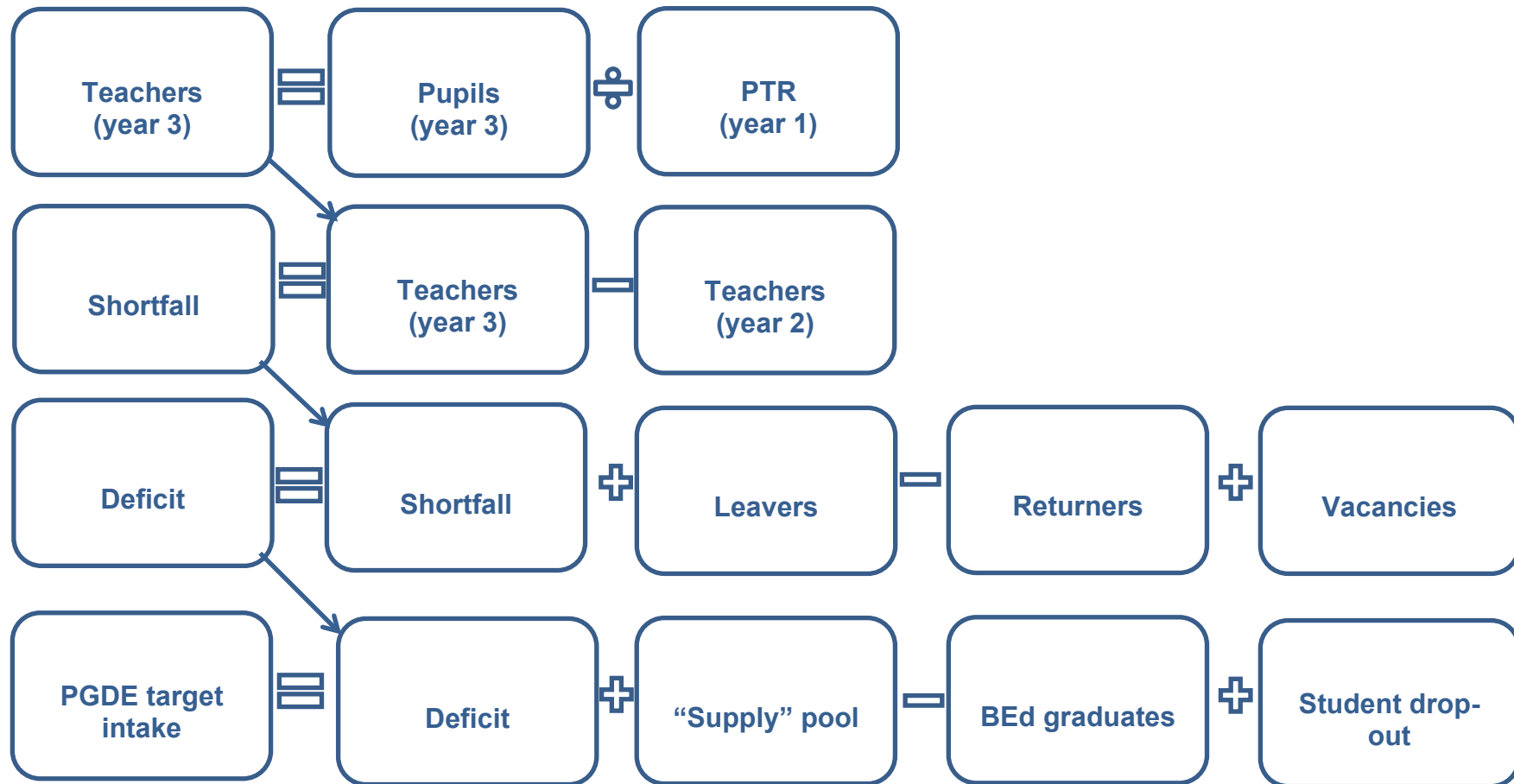
Secondary	Projected pupils (secondary and half of special)	Demand for teachers at start of academic year	Change in demand from previous year	Leavers during previous year	Vacancies arising during previous year	Teachers returning to profession in previous year	Projected Deficit at start of year
2016	284,331	24,783					
2017	285,329	25,022	239	1,320	1,751	452	1,298
2018	288,882	25,453	431	1,298	1,802	452	1,518**
2019	295,569	25,956	503	1,292	1,635	452	1,352**
2020	302,978	26,300	343	1,264	1,582	452	1,299**
2021	307,813	26,618	318	1,262	1,639	452	1,187
2022	312,423	26,995	377	1,248	1,248	452	796
2023	315,634	26,995	0	1,227	1,115	452	663

** includes 169 (507/3) vacancies

Teacher workforce planning timeline

Year 1				Year 2								Year 3																
S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	
Census Day			Census publication. TWPAG	PGDE apps								PGDE intake										Graduate	Start teaching					

Teacher workforce planning model



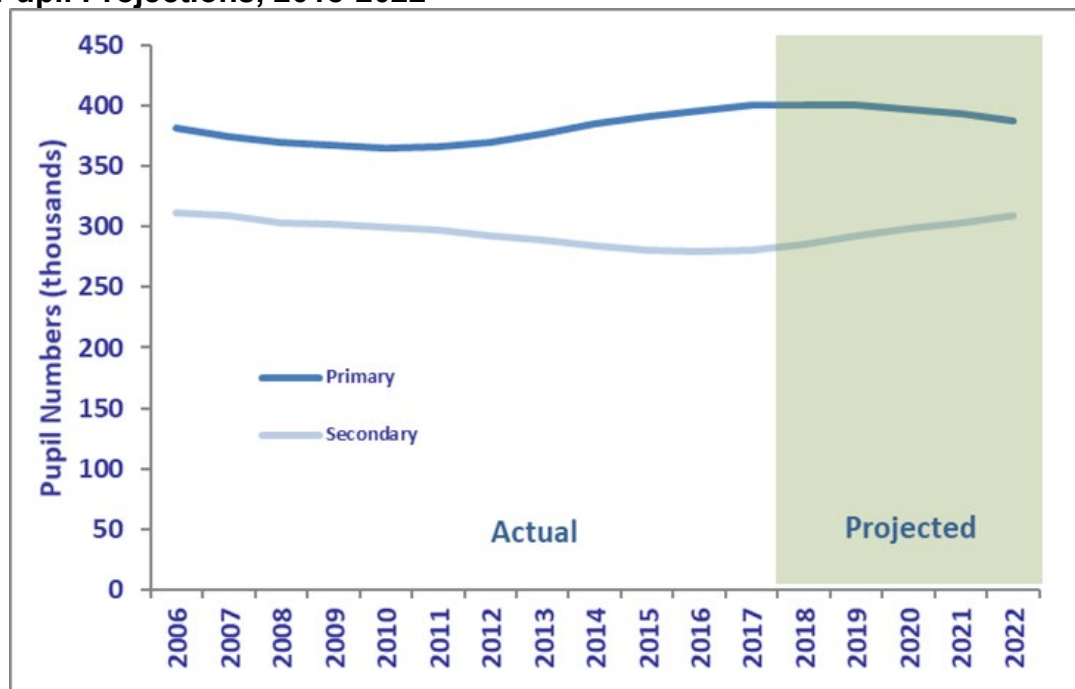
Teacher workforce planning 2018

The teacher workforce planning model estimates future student intake numbers by rolling forward recent patterns in census and other data and is based on a set of assumptions. Other assumptions would result in different estimates.

1. Model Inputs

1.1. Pupil projections

Pupil Projections, 2018-2022



The primary school roll has been rising in recent years but the 2017 based projections show the number of primary pupils has peaked and are projected to drop slightly to the end of the projection period.

At secondary, however, the pupil roll increased in 2017 for the first time in 14 years. This was largely due to the increased primary roll graduating onto secondary school and increases in staying on rates (both S4-S5 and S5-S6) in recent years. The projections show the number of secondary pupils continuing to rise steadily to 2022.

Staying-on rates of secondary pupils, 2009 – 2017

	All pupils	
	S3-S5	S3-S6
2009	79.7%	49.2%
2010	82.9%	53.3%
2011	83.4%	55.6%
2012	84.9%	58.3%
2013	86.1%	60.3%
2014	87.2%	61.7%
2015	87.7%	62.7%
2016	87.3%	62.6%
2017	87.4%	62.2%

1.2. Pupil Census

The 2018 Pupil Census showed an decrease of 36 primary pupils and an increase of around 4,150 secondary pupils, compared to 2017.

1.3. Teacher Census

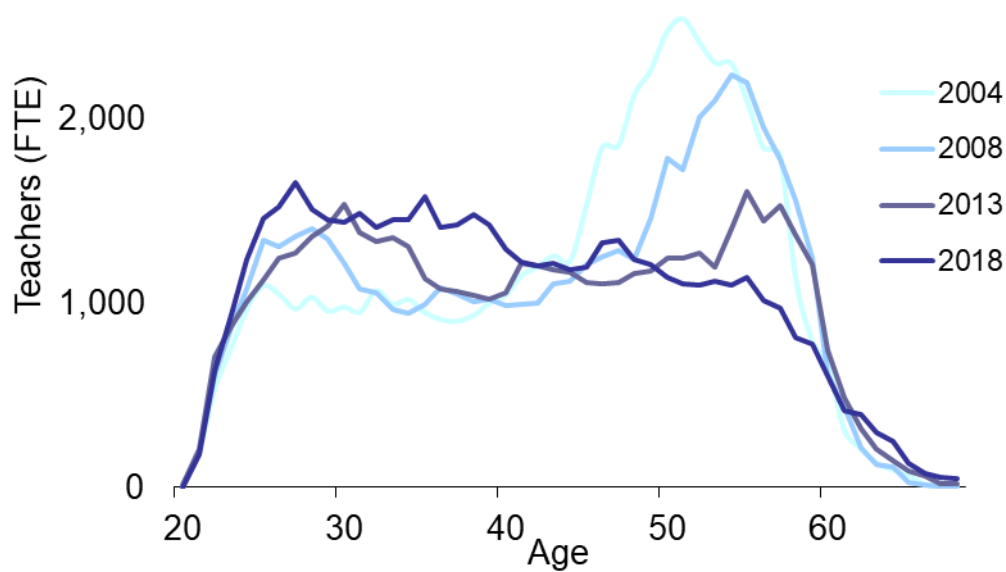
The 2018 Teacher Census reported an increase in primary teachers of 422 FTE and an increase in secondary teachers of 167 FTE. There was also a small increase in the number of special school teachers (47) and a decrease in centrally employed (-90). There was also a decrease in early learning and childcare teachers (-99).

The teacher FTE count includes 962 Attainment Scotland Fund (ASF) funded posts. This demand for these teachers is accounted for in this year’s workforce planning process, as vacant posts due to ASF demands will have appeared in the vacancy figures which have been accounted for in the statistical model.

1.4. Age profiles of teachers

The 2018 Teacher Census data shows that the age profile of teachers has changed much over the past 15 years. The prominent peak of teachers in their fifties, as seen in 2008, no longer exists and the age distribution is now more even.

Age profile of school based teachers



1.5. Working patterns

The percentage of teachers working part-time has been fluctuating slightly over the last nine years and increased by 1.2 percentage points from 22.4% in 2016 to 23.4% in 2017, the highest rate over this period. (Data on working patterns is not yet available for 2018)

Number of teachers (headcount) by mode of working, all sectors, 2010-2016

	Full-time	Part-time	Total headcount ⁽¹⁾	Percentage part-time
2008	46,202	9,716	55,918	17.4
2009	44,757	10,361	55,118	18.8
2010 ⁽¹⁾	43,660	10,767	54,427	19.8
2011 ⁽¹⁾	42,572	10,701	53,273	20.1
2012 ⁽¹⁾	42,497	10,568	53,065	19.9
2013	42,472	10,427	52,899	19.7
2014 ⁽³⁾	41,934	10,866	52,800	20.6
2015	41,884	11,256	53,140	21.2
2016	41,701	12,003	53,704	22.4
2017				
Primary	20,012	7,809	27,821	28.1
Secondary	20,405	4,515	24,920	18.1
Special	1,529	537	2,066	26.0
Total	41,952	12,782	54,734	23.4

(1) Teachers are counted as full-time if their total FTE across all schools where they teach is greater or equal to one.

(2) Data on early learning and childcare, primary and total teachers along with associated pupil teacher ratios for 2010, 2011, 2012 were revised in 2013 to remove teachers who were double counted as a result of working in both sectors.

(3) 2014 Teacher figures were amended in February and December 2015. See background notes.

Excludes centrally employed and early learning and childcare teachers.

1.6. Vacancy data

The local authority vacancy collection in September showed that there were 204 pre-school/primary and 402 secondary full-time and part-time permanent vacancies as at September 2018 (excluding head teachers and deputy head teachers).

The target student intake figures have been increased in line with these figures (accounting for drop out etc) on a one year basis for primary and a phased, more manageable, three year basis for secondary.

Increasing target student intakes is not a guarantee that vacancies will be filled.

2. Assumptions

2.1. Leaver rates

Leaver rates are based on teachers in permanent employment only, as these are more stable and a more reliable measure of churn. Leavers include career breaks, retirements, teachers on maternity leave and any other long term or permanent move away from teaching. The percentage of permanent teachers "leaving" decreased from 5.5% in 2017 to 5.2% in 2018. Leaver rates for female teachers between the ages of 30-40 are broadly similar to previous years.

The pattern of maternity leavers by age was also similar to previous years.

2.2. Returner rates

Returner rates are also based on teachers in permanent employment.

The average of the last three years' figures in primary was 461. The average of the last three years figures has been used for Secondary (352).

2.3. Supply pool

The model accounts for the need of a pool of supply teachers and increases the student intake figure by 12% for this purpose. This is in line with the figure used last year.

2.4. PTRs

The model is based on the assumption of maintaining pupil teacher ratios (PTRs), therefore it projects future teacher requirements in line with pupil projections on the basis of current PTRs.

The 2018 pupil and teacher census results show that the primary sector PTR has improved from 16.4 in 2017 to 16.1 in 2018, and the secondary PTR increased from 12.2 to 12.3.

2.5 Retention rates

Retention rates (ITE students who go on to the Teacher Induction Scheme) vary between routes. Retention rates for Primary BEd and PGDE courses are around 75% and 80% respectively. Rates for Secondary courses are around 85% (BEd) and 80% (PGDE).

2.6 Post-probationer employment rates

The 2018 Teacher Census indicates that there has been an increase in the proportion of post-probationers in employment (permanent or temporary, full time or part-time). The figure has risen from 66% in 2011 to 87% in 2018, with the largest increase in the proportion of post-probationers with full-time permanent contracts (up from 13% in 2010 to 55% in 2018).

3. Model Results

The combination of the primary school pupil roll falling and the recent increase in primary teachers means that the model projects a lower requirement for new student teachers. Accounting for the pre-school and primary vacancies, the model projects that the 2019 intake target should be cut.

At secondary, the peak in school aged children over the past five years can be seen to be shifting from primary to secondary school. This is countered by a number of factors including an increase in the number of secondary school teachers and a decrease in the number of secondary vacancies. Hence the model suggests the intake target should remain at a similar level.

Vacancies for secondary have been smoothed across 2019, 2020 and 2021.

Primary and Secondary Student Intake Projections, 2019-2023

Primary vacancies accounted for in 2019 intake only

Secondary vacancies accounted for across 2019-2021 intake

Entry Year	Primary		Secondary		Combined
	BEd	PGDE	BEd	PGDE	
2018 target intake	710	1,230	190	1,750	250
2018 actual intake	718	1,260	159	1,494	271
2019	700	550	185	1,750	195
2020	700	200	185	1,700	195
2021	700	350	185	1,600	195
2022	700	350	185	1,150	195
2023	700	450	185	850	195

Note: Primary estimates do not include any additional requirement for ELC sector.

The model outputs have been rounded to the nearest fifty.

TWPAG/2018/

Primary and Secondary Teacher Projections, 2018-2023

Primary	Projected pupils (pre-school, primary and half of special)	Demand for teachers at start of academic year	Change in demand from previous year	Leavers during previous year	Vacancies arising during previous year	Teachers returning to profession in previous year	Projected Deficit at start of year
2018	493,996	27,028					
2019	487,646	26,928	-100	1,429	1,273	461	812
2020	483,273	26,771	-156	1,394	1,198	461	941*
2021	479,876	26,575	-196	1,373	1,114	461	653
2022	475,532	26,316	-259	1,347	1,177	461	717
2023	472,402	26,146	-170	1,330	1,193	461	732

**includes 274 vacancies*

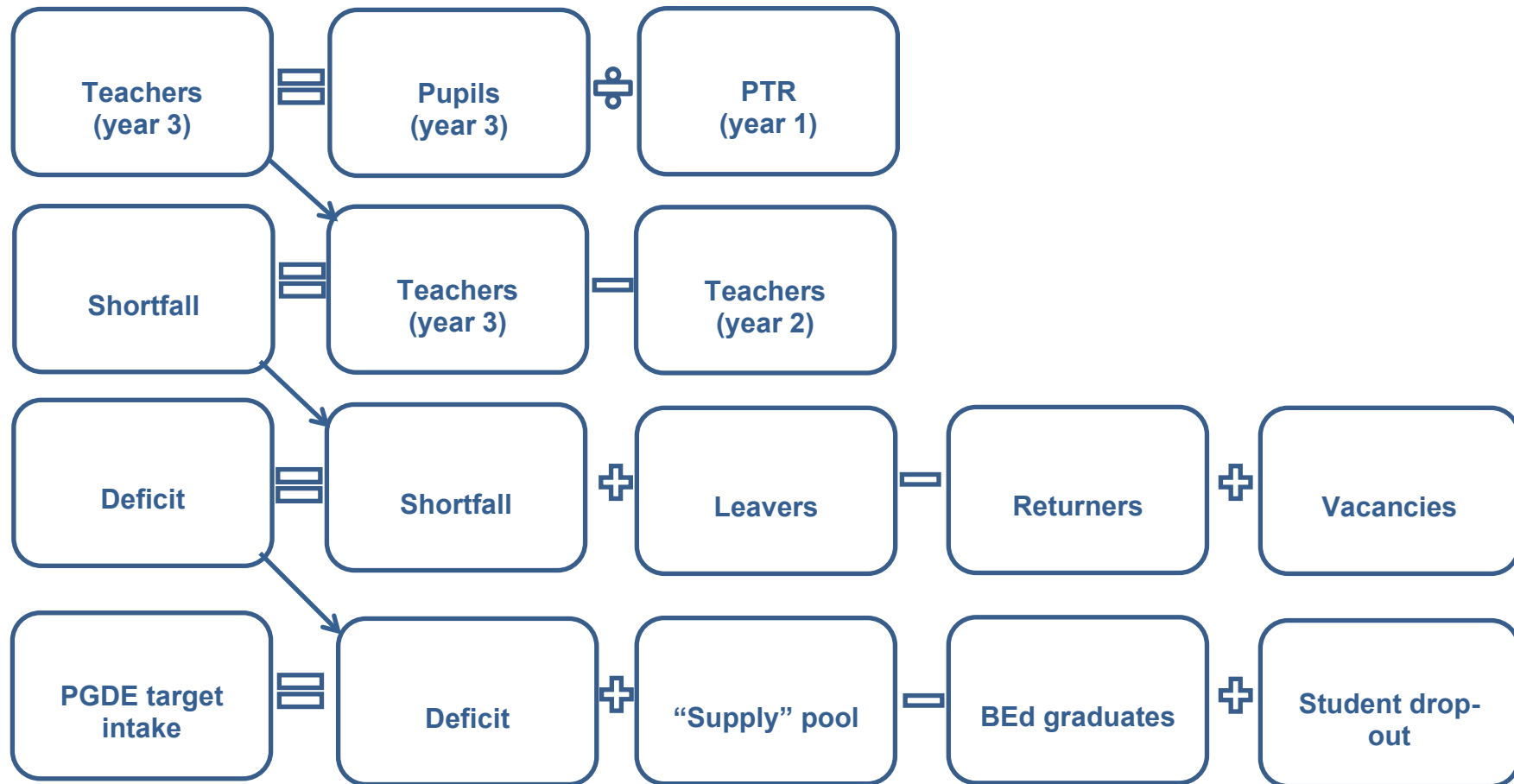
Secondary	Projected pupils (secondary and half of special)	Demand for teachers at start of academic year	Change in demand from previous year	Leavers during previous year	Vacancies arising during previous year	Teachers returning to profession in previous year	Projected Deficit at start of year
2018	289,563	24,924					
2019	296,014	25,358	433	1,282	1,755	352	1,403
2020	303,037	25,830	473	1,277	1,583	352	1,365**
2021	307,630	26,136	306	1,266	1,576	352	1,358**
2022	312,311	26,446	310	1,270	1,473	352	1,255**
2023	315,360	26,649	203	1,245	1,326	352	974

*** includes 134 (402/3) vacancies*

Teacher workforce planning timeline

Year 1				Year 2								Year 3																
S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	
Census Day			Census publication. TWPAG	PGDE apps								PGDE intake										Graduate	Start teaching					

Teacher workforce planning model



Teacher workforce planning 2022 Exercise – October 2021 Statistical Model

The teacher workforce planning model estimates future student teacher intake numbers by rolling forward recent patterns in the school pupil and staff censuses and other data including national population projections.

The most recent data used in this model are the 2020 school pupil and staff censuses and the 2018 based national population projections. It is based on a set of assumptions - other assumptions would result in different estimates.

1. Teacher Targets – PfG and SGP agreement commitments

“Over the course of the Parliament, we will provide funding to support the recruitment of at least 3,500 teachers and 500 classroom assistants - over and above the 1,400 recruited during the pandemic”

At the time of the last teacher census in September 2020 there were 53,400 (FTE) teachers recorded. Local authorities reported that the total of 53,400 teachers included an estimated 1,200 additional teachers funded through covid recovery funding.

Returns from local authorities showed that by November the number of teachers recruited using the initial covid recovery funding had increased to 1,400. We can assume that these further 200 covid recovery teachers were additional to those 1,200 teachers reported at census time.

This means that we can assume our starting point for calculating the total number of teachers that need to be in the system to achieve the PfG/SGP agreement commitments is 53,600. This is the 53,400 from the census plus the additional 200 teachers recruited by the end of November 2020. The total number of teachers needed to meet the PfG/SGP agreement commitments is therefore **57,100**, based on adding 3,500 to the estimated total number of teachers at the point when all 1,400 covid recovery teachers were in place (i.e. 53,600 in November 2020).

2. Modelling approach

Workforce planning model has historically been based upon the assumption of maintaining pupil teacher ratios across each sector. With pupil numbers projected to fall overall by 2025, the modelled requirement for teachers would be 52,700 by 2025 if PTRs were matched.

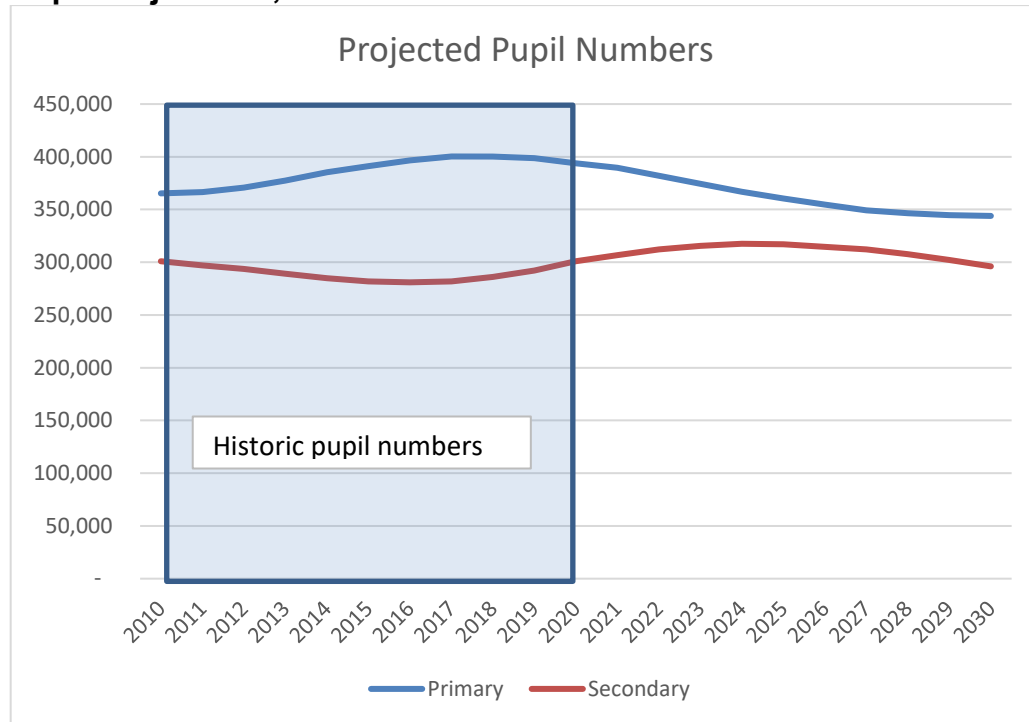
Instead of this approach, the statistical modelling has looked at the ITE students required to meet the PfG targets by 2025.

Beyond 2025 two scenarios have been considered, maintaining teacher levels as at 2025 and maintaining pupil teacher ratios as at 2025

3. Model Inputs

3.1. Pupil projections

Pupil Projections, 2021-2030



The primary school roll has begun to fall having risen up to a peak in 2017. The projections show numbers are projected to drop to the end of the projection period.

At secondary level, the pupil roll increased in 2017 for the first time in 14 years and is projected to continue increasing until 2024. After which they will fall back to current levels by the end of the projection period in 2030.

These projections are based on the 2018 population projections which, following a fall in recent births, are assuming a lower birth rate than previous projections. Pupil projections based on cohorts that were not yet born are less reliable than projections for earlier years (beyond 2024 for Primary and 2030 for Secondary). It's worth noting that actual births in 2019 and 2020 were lower than the projected totals and so pupil rolls are likely to be lower than currently projected.

3.2. Teacher Numbers

In the past 5 years we have seen a large rise in teacher numbers of 2,700 (a 5% increase). There have been increases across both the primary and secondary sectors. The 10% increase in primary teachers (compared to 1% increase in pupils) has meant that there are fewer pupils per teacher and consequently the primary pupil teacher ratio (PTR) has decreased to the lowest ever level. However, in secondary schools the number of pupils grew at a faster rate (7%) than the number of teachers (4%), meaning there were more pupils per teacher. The result of this is that the secondary PTR is now at the highest level since 2004.

Increase in teacher numbers 2015-2020

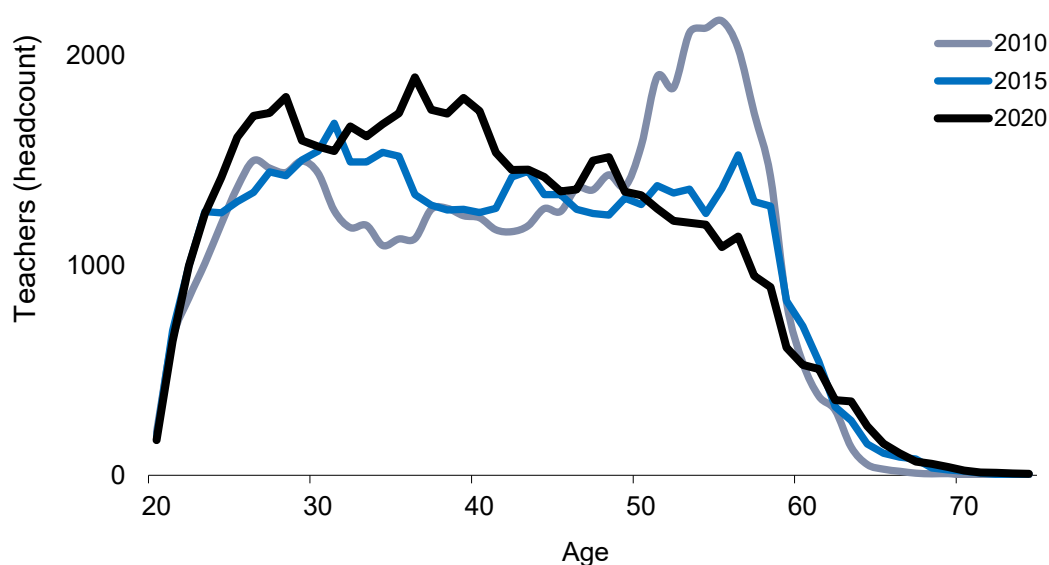
	Primary	Secondary	Total*
2015 - 2020	10%	4%	5%

*Total change across this period also included reductions to centrally employed teachers and ELC teachers.

3.3. Age profiles of teachers

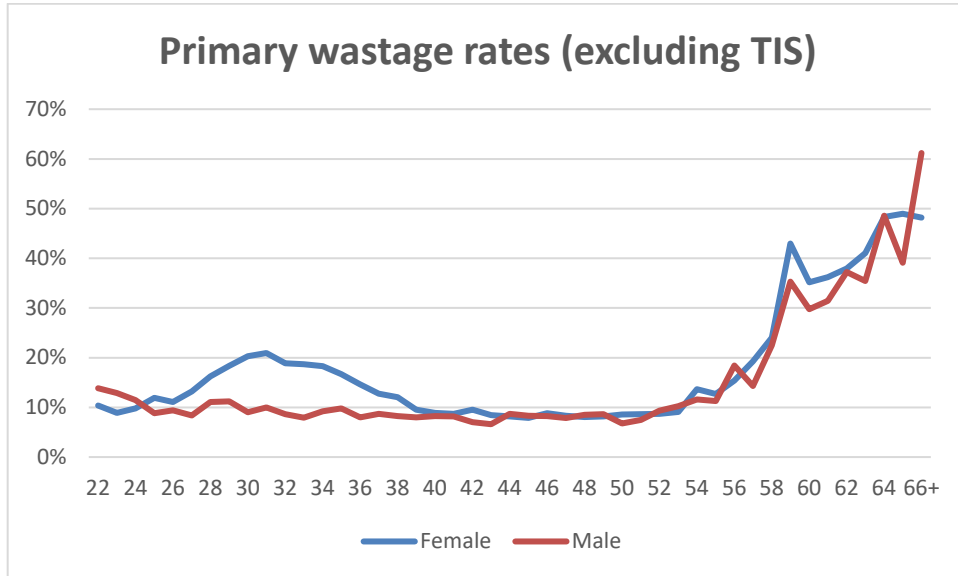
The 2020 Teacher Census data shows that the age profile of teachers has changed much over the past 10 years. The prominent peak of teachers in their fifties, as seen in 2010, no longer exists. The largest group of teachers are now aged 25 to 40.

Age profile of school based teachers

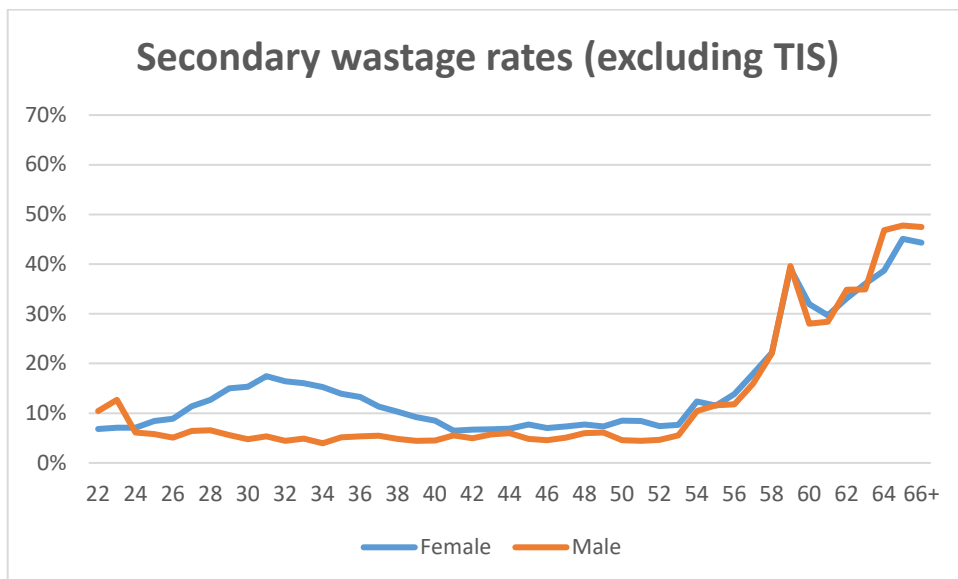


3.4. Wastage Rates (Excluding probationers)

Wastage rates are based on an average of the past five years' figures. They represent the sum of all reductions in FTE as a proportion of total FTE. Higher rates for women under 40, include maternity leave, whilst higher rates for those from their late 50s reflect retirement (both full and partial).



Total projected 2020 primary wastage – 3,600 FTE



Total projected 2019 secondary wastage – 2,700 FTE

3.5. Returners

Returner numbers are based on an average of five years of data. They represent the sum of all increases in FTE. Numbers are used instead of rates for returners since as we do not have details of the pool of non-working teachers in any year.

The average of the last five years' figures have been used for Primary (2,500) and secondary (1,900).

3.6. Teacher Induction Scheme (TIS) Wastage rates

Teacher Induction Scheme wastage rates are based on an average of the last 5 years of data. These rate calculate the percentage reduction in FTE of TIS teachers in the year following their probation year.

Primary – 19%

Secondary – 16%

3.7. Working patterns

There has been a steady increase in the proportion of teachers working part time over recent years up to 24.0% in 2019. This was reversed slightly in 2020 with the proportion of teachers working part time reducing to 23.4%. The overall move to part time working has been accounted for in the model within the wastage and returners assumptions.

Table 1.3: Number of teachers (headcount) by mode of working, all sectors, 2017 - 2020

	Full-time	Part-time	Total headcount ⁽²⁾	Percentage part-time
2017	43,016	12,693	55,709	22.8
2018	43,198	13,265	56,463	23.5
2019	43,246	13,620	56,866	24.0
2020				
Primary	20,732	8,338	29,070	28.7
Secondary	21,175	4,627	25,802	17.9
Special	1,558	619	2,177	28.4
Centrally Employed	702	612	1,314	46.6
Total	44,387	13,564	57,951	23.4

3.8. Retention rates

Retention rates (ITE students who go on to the Teacher Induction Scheme) vary between routes. Retention rates for Primary undergraduate and PGDE courses are around 75% and 90% respectively. Rates for Secondary courses are around 60% (Undergraduate including combined degrees) and 80% (PGDE).

We measure retention rates as a proportion of those leaving university to those starting the teacher induction scheme. Probationers who chose the flexible route are not captured in these retention rates, but are captured in the model amongst the pool of 'returners'.

3.9. Supply pool

Supply pool teachers are not accounted for in the staff census which counts either the normal complement member of staff or their replacement. Teachers moving from a teaching position which is counted in the census to a supply post will be accounted for in the wastage (leaver) rates. No additional provision for supply staff has been included. We expect that the current level of supply pool will be maintained by staff entering it from the on-roll population, accounted for by the wastage rates.

3.10. Vacancy data

In previous years, data on teacher vacancies has been collected in September at staff census time. This data has not been collected this year and vacancies have not been accounted for in the model.

4. Routes to meeting the 2025 commitment (PGDE targets 2022-2024)

Meeting the commitment to increase teacher numbers to 57,100 by 2025 equates to a 7% increase in teachers over the 5 year period. The modelling has focussed on PGDE programmes as there is insufficient time for changes to undergraduate programmes to impact on teacher numbers in this parliamentary term.

The first scenario considered (Scenario A below) looked at whether meeting the current ITE levels would be sufficient to meet the additional teacher numbers we have committed to by 2025. The modelling shows that meeting the current ITE target levels would be likely to be sufficient to meet the commitment.

Scenario A assumes that ITE targets are met – although it is important to note that we haven’t seen this happen in secondary in recent years. **Scenario B** shows the impact of increasing primary places to make up for any shortfalls from secondary targets not being met whilst still training enough students to meet the overall target.

Modelling of ITE places to meet the target of a 7% increase in teachers

	Primary	Secondary	Total
Projected changes in pupils 2020-2025	-9%	5%	-2%

	Projected change in teacher numbers 2020-2025			Average postgraduate ITE places 2022-2024	
	Primary	Secondary	Total	PGDE Primary	PGDE Secondary
Scenario A: Maintaining current ITE targets	4%	10%	7%	1,150	1,800
Scenario B: Maintain achievable ITE levels	6%	8%	7%	1,350	1,600
Scenario C: Sector split matching projected pupil change	0%	14%	7%	700	2,300

* Scenario C is considered later in this submission.

The results show that maintaining current ITE targets across sectors and subjects, as modelled in scenario A, would – if targets were met – mean a big increase in primary teacher numbers relative to the falling number of primary pupils (4% rise in teachers vs 9% fall in pupils). This is in contrast to secondary where the 10% rise in teachers would be more closely matched by the 5% rise in pupils. This effect would be more pronounced if primary targets were raised to make up for any shortfalls from secondary targets not being met, as modelled in scenario B.

The impact of adopting either of these approaches, where primary PGDE intake levels are maintained or increased, is that the primary sector, where pupil teacher ratios are at the lowest (best) ever level and there are already signs of oversupply, will have an increased availability of teachers at the expense of the secondary sector, where the PTR level is at its highest (worst) point since 2004.

An alternative to this approach would be to set targets for universities to train sufficient teachers to allow a proportionate increase in teachers compared to changes in pupil numbers across both primary and secondary sectors. **Scenario C** in the table above allows for the increase in teacher numbers to be split relative to projected changes in the pupil population (i.e. no increase for primary, significant increases for secondary). This means no change in primary teacher levels from the 2020 census position (because we are expecting a fall in primary pupil numbers) and a 14% increase in secondary teachers.

The modelling for Scenario C shows that to meet these sector specific targets would require a reduction in primary ITE places and a substantial increase in secondary ITE places.

5. Beyond 2025

Pupil projections show a continued decrease in pupil numbers beyond 2025. We have considered two options for teacher requirements beyond 2025.

- Option 1 – PTRs are maintained in each sector (resulting in a decrease in teacher numbers)
- Option 2 – teacher numbers are maintained in each sector

Both options result in a reduced requirement for ITE provision compared to the period up to 2025 when teacher numbers are increasing.

For modelling purposes undergraduate provision remains fixed. An alternative to reducing postgraduate provision from 2025 onwards, would be to reduce undergraduate provision from 2022 onwards.

The underlying position assumes that ITE targets have remained fixed until 2024 (scenario A presented above).

Option 1 - Primary and Secondary Student Intake Projections, 2025-2029, Maintaining PTRs

The model outputs for the PGDE courses have been rounded to the nearest fifty. Targets for undergraduate courses have been fixed at 2021 target levels.

Entry Year	Primary		Secondary		
	U/G (including combined)	PGDE	BEd	PGDE	Combined
2024	780	1150	1165	1800	170
2025	780	600	165	1000	170
2026	780	500	165	900	170
2027	780	650	165	700	170
2028	780	700	165	500	170
2029	780	750	165	400	170

Option 2 - Primary and Secondary Student Intake Projections, 2025-2029, Maintaining teacher numbers

The model outputs for the PGDE courses have been rounded to the nearest fifty. Targets for undergraduate courses have been fixed at 2021 target levels.

Entry Year	Primary		Secondary		
	U/G (including combined)	PGDE	BEd	PGDE	Combined
2024	780	1150	1165	1800	170
2025	780	1000	165	1300	170
2026	780	1000	165	1200	170
2027	780	1000	165	1200	170
2028	780	1000	165	1200	170
2029	780	1000	165	1200	170