

## **Teacher workforce planning 2021 exercise – November 2020 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 2019 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.

The model has been rebuilt since the last TWPAG meeting, modelling changes have made it easier to change assumptions and run different scenarios. Details of changes made to the assumptions are in section 2. Alternative scenarios which look at the impact of changing some of these assumption are presented in section 4.

### **1. Model results – student intake projections**

Due to the projected primary school pupil roll continuing to fall – the model projects a substantially lower requirement for new student teachers. The model projects that the 2021 intake target should be cut to 550 teachers

Looking further - the primary student roll is projected to continue to fall over the next 10 years. Due to this, the model projects that if the undergraduate target of 780 is maintained then there will be a substantially reduced requirement for primary PGDE students.

At secondary level, pupil rolls are projected to continue to increase until 2023. The model suggests the intake target should remain at a similar level in 2021, with substantial reductions in PGDE targets from 2023 onwards.

### Primary and secondary student intake projections, 2021-2030

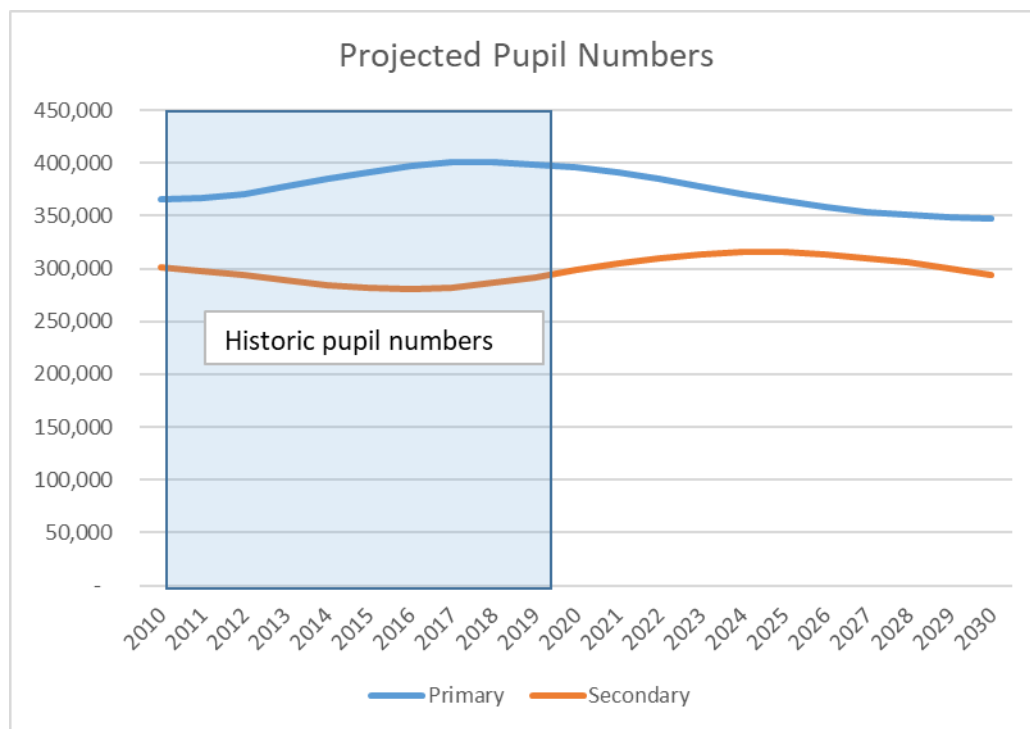
The model outputs for the PGDE courses have been rounded to the nearest fifty. Targets for undergraduate courses have been fixed at 2020 target levels.

Entry Year	Primary		Secondary		
	U/G (including combined)	PGDE	BEd	PGDE	Combined
<b>2020 Target Intake</b>	779	1155	165	1800	171
<b>2020 actual Intake (provisional)</b>	854	1214	161	1647	118
<b>2021</b>	780	550	165	1600	170
<b>2022</b>	780	450	165	1500	170
<b>2023</b>	780	400	165	1300	170
<b>2024</b>	780	400	165	1100	170
<b>2025</b>	780	350	165	900	170
<b>2026</b>	780	350	165	800	170
<b>2027</b>	780	350	165	650	170
<b>2028</b>	780	400	165	500	170
<b>2029</b>	780	450	165	400	170
<b>2030</b>	780	450	165	400	170
<b>2031</b>	780	400	165	400	170

## 2. Model inputs

### 2.1. Pupil projections

#### Pupil projections, 2018-2030



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).

## 2.2. Age profiles of teachers

The 2019 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 2009, no longer exists. The largest group of teachers are now in the 25 to 35 age range.

### Age profile of school based teachers



## 2.3. Leavers (wastage) and returners modelling changes

Induction scheme teachers are now modelled separately from the general teacher population – allowing different assumptions to be made about and applied to this group of teachers. The teacher induction scheme wastage rates represent the reduction in FTE of induction scheme teachers in the census following their induction year.

The approach to modelling leavers and returners of other teachers has also been updated. These are now based on on-roll teachers in the teacher

census (so they would class a teacher moving to maternity leave as a leaver and a teacher returning from maternity leave as a returner). Temporary staff are also included. These calculations also account for staff either reducing or increasing the number of hours they work –meaning the recent trend of increased part time working is now accounted for in the model.

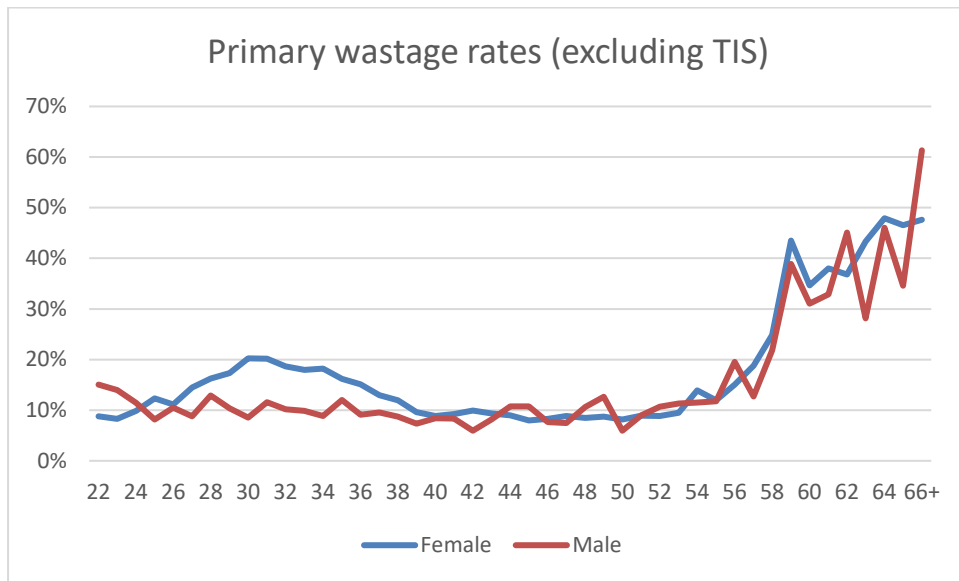
Given that they now include FTE reductions as well as teachers leaving posts, they are described as wastage rates in the rest of this paper.

It's important to note that the numbers of leavers and returners reflects pressures of both supply and demand for teaching staff. The 2019 data saw a reduction in returners as well as an increase in TIS wastage rates at primary level. One possible explanation for this is that there is a reduced demand for primary teachers.

#### **2.4. Wastage rates (excluding probationers)**

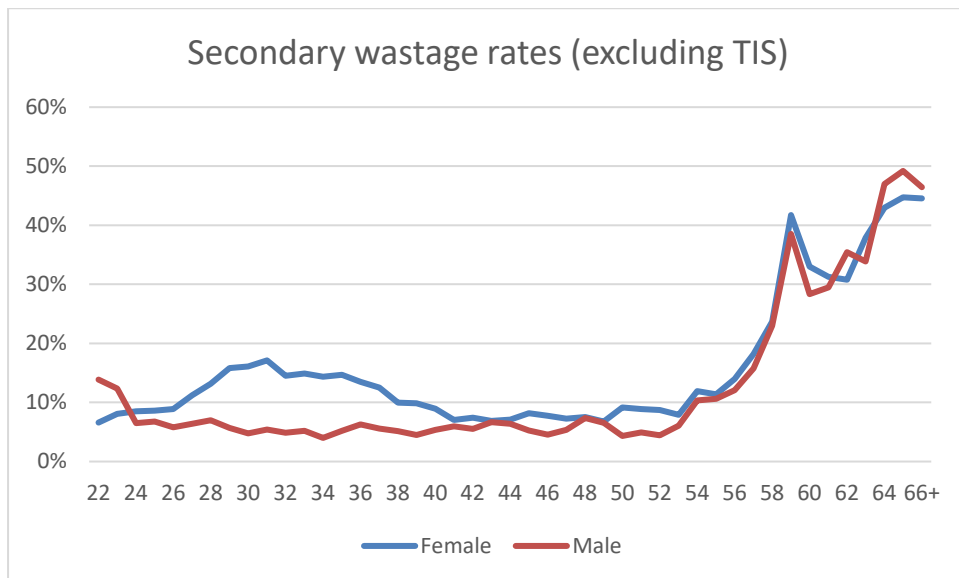
Wastage rates are based on an average of the past three years' figures. They represent the sum of all reductions in FTE as a proportion of total FTE. Higher rates for women under 40, include maternity leave, whilst higher rates for those from their late 50s reflect retirement (both full and partial).

### Primary wastage rates by age and sex



Total projected 2019 primary wastage – 3,582 FTE

### Secondary wastage rates by age and sex



Total projected 2019 secondary wastage – 2,767 FTE

## **2.5. Returners**

Returner numbers are based on an average of 3 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 three years' figures have been used for Primary (2,378) and secondary (1,897).

## **2.6. Teacher Induction Scheme (TIS) wastage rates**

Teacher Induction Scheme wastage rates are based on an average of the last 3 years of data. These rate calculate the percentage reduction in FTE of TIS teachers in the year following their probation year.

Primary – 18%

Secondary – 16%

## **2.7. Historic post Teacher Induction Scheme employment rates**

The 2019 Teacher Census indicates that there has been a decrease in the proportion of post-probationers in employment (permanent or temporary, full time or part-time). This is the second year of a decrease in overall employment rates following a steady rise to the 2016/17 cohort, when just 12% of TIS post-probationers were not teaching in the year following their probation. These figures show headcount, whilst the model's FTE wastage rates (detailed in section 2.6) reflect the fact that some post probation teachers have taken part time roles.

## Teacher Induction Scheme post-probationers teaching in the year following their probation

*Percentage of headcount*

	TIS probationer cohort							
	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Full-time								
permanent	28	35	39	45	55	57	55	48
Full-time temporary	35	35	33	35	27	28	27	30
Part-time								
permanent	3	2	2	2	2	1	2	2
Part-time								
temporary	8	6	6	4	2	2	3	5
Other <sup>(1)</sup>	25	21	20	14	13	12	13	16
Headcount of								
teachers in cohort	1,944	2,044	2,215	2,448	2,524	2,630	2,852	2,836

(1) The "Other" category includes those teaching elsewhere, including in the independent sector, those who have found supply work, and those who are unemployed or who have left teaching, although this detail is not included in the census data.

### 2.8. Working patterns

There has been a steady increase in the proportion of teachers working part time over recent years, from 19.7% in 2013 to 24.4% in 2019. This increased move to part time working has been accounted for in the model via the revised leavers and returners assumptions. The model projects this trend of increased part-time working to continue to rise in future years.



**Table 1.3: Number of teachers (headcount) by mode of working, all sectors, 2008 - 2019**

	Full-time	Part-time	Total headcount <sup>(1)</sup>	Percentage part-time
2008	46,202	9,716	55,918	17.4
2009	44,757	10,361	55,118	18.8
2010	43,660	10,767	54,427	19.8
2011	42,572	10,701	53,273	20.1
2012	42,497	10,568	53,065	19.9
2013	42,472	10,427	52,899	19.7
2014	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	41,952	12,782	54,734	23.4
2018	42,253	13,330	55,583	24.0
2019				
Primary	20,188	8,317	28,505	29.2
Secondary	20,642	4,693	25,335	18.5
Special	1,530	670	2,200	30.5
Total	42,369	13,647	56,016	24.4

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

## 2.9. Pupil Census

The 2019 Pupil Census showed a decrease of around 1,500 primary pupils and an increase of around 6,000 secondary pupils, compared to 2018.

## 2.10. Teacher Census

The 2019 Teacher Census reported an increase in primary teachers of 128 FTE and an increase in secondary teachers of 205 FTE. There was also an

increase in the number of special school teachers (44) and a decrease in centrally employed (-67) and early learning and childcare teachers (-23).

The teacher FTE count includes teachers currently funded through the Attainment Scotland Fund (ASF) and therefore they are accounted for in this year's teacher workforce planning model.

### **2.11. Pupil Teacher Ratios (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 PTRs from the current year.

The 2019 pupil and teacher census results show that the primary sector PTR has improved from 16.1 in 2018 to 15.9 in 2018 whilst the secondary PTR worsened from 12.3 to 12.4.

### **2.12. 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'.

### **2.13. COVID recovery teachers**

The Scottish Government has provided £75M of funding for additional COVID recovery teachers in the 2020/21 school year and estimated that this will fund 1,400 additional teachers.

We have taken account of these teachers in the primary side, assuming an additional 900 teachers for 2020 by setting the primary PTR to 15.4.

The baseline model assumes that the funding is for 1 year only and after that the PTR will revert to 2019 levels.

#### **2.14. 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.

#### **2.15. Vacancy data**

In previous years, data on teacher vacancies has been collected in September at staff census time. This year that has coincided with local authorities undertaking recruitment for covid recovery teachers. Given these circumstances this data has not been collected this year. Vacancies have not been accounted for in the model.

### 3. Detailed model results – teacher projections

#### 3.1. Teacher projections by sector

	<b>ELC</b>	<b>Primary</b>	<b>Secondary</b>	<b>Special</b>	<b>Centrally Employed</b>
2013	1,288	22,905	23,695	2,020	1,170
2014	1,200	22,960	23,401	1,974	1,186
2015	1,038	23,425	23,059	1,911	1,283
2016	985	23,920	22,957	1,869	1,239
2017	921	24,477	23,150	1,836	1,129
2018	821	24,899	23,317	1,883	1,039
2019	798	25,027	23,522	1,927	972
2020	747	25,686	23,999	1,807	956
2021	726	24,666	24,359	1,836	962
2022	711	24,312	24,700	1,860	964
2023	709	23,946	24,975	1,875	962
2024	709	23,581	25,104	1,891	958
2025	707	23,284	25,061	1,901	950
2026	705	23,008	24,913	1,906	942
2027	705	22,772	24,716	1,899	931
2028	704	22,594	24,415	1,886	921
2029	702	22,489	24,041	1,878	910
2030	700	22,454	23,649	1,869	899

### 3.2. Workforce projections

#### Primary workforce projections 2019-2030

<b>Year</b>	<b>Primary Teachers (excluding TIS) - includes ELC and share of special and centrally employed</b>	<b>Teacher Induction Scheme (TIS)</b>	<b>Returning Teachers</b>	<b>Wastage (excluding TIS)</b>	<b>TIS wastage</b>	<b>Incoming TIS</b>
2019	25,608	1,769	2,684	3,582	324	1,786
2020	26,155	1,786	2,378	3,641	1,446	1,687
2021	25,232	1,687	2,378	3,513	300	1,080
2022	25,484	1,080	2,378	3,528	192	979
2023	25,223	979	2,378	3,475	174	913
2024	24,930	913	2,378	3,427	162	913
2025	24,631	913	2,378	3,377	162	881
2026	24,383	881	2,378	3,332	157	864
2027	24,153	864	2,378	3,292	154	877
2028	23,949	877	2,378	3,258	156	918
2029	23,790	918	2,378	3,229	163	966
2030	23,694	966	2,378	3,213	172	969

\*The model has adapted to the introduction of COVID recovery teachers in 2020 by adjusting with an increase in the rate of returners from 2019 and an increase in the TIS wastage rate in 2020.

## Secondary workforce projections 2019-2030

<b>Secondary Teachers (excluding TIS) - includes share of special and centrally employed</b>						
<b>Year</b>	<b>Teacher Induction Scheme (TIS)</b>	<b>Returning Teachers</b>	<b>Wastage (excluding TIS)</b>	<b>TIS wastage</b>	<b>Incoming TIS</b>	
2019	23,540	1,304	2,012	2,767	220	1,384
2020	23,870	1,384	1,897	2,784	296	1,560
2021	24,071	1,560	1,897	2,778	253	1,487
2022	24,497	1,487	1,897	2,800	241	1,425
2023	24,840	1,425	1,897	2,807	231	1,277
2024	25,123	1,277	1,897	2,817	207	1,087
2025	25,272	1,087	1,897	2,817	176	948
2026	25,263	948	1,897	2,810	154	862
2027	25,144	862	1,897	2,796	140	727
2028	24,967	727	1,897	2,777	118	615
2029	24,696	615	1,897	2,747	100	550
2030	24,361	550	1,897	2,713	89	536

#### **4. Alternative scenarios and assumptions**

The updated model makes it easier to change assumptions and model different scenarios. The table below details the results from a series of alternative models. The line highlighted in yellow is the baseline model used.

These alternative models mainly focus on looking at alternative options for the leaver and returners. There are options which base the rates on 1 and 5 years of data rather than the 3 in the baseline model. An option which does not include temporary teachers in the calculations is also presented.

Further scenarios include are to present the outputs if 2018 census data was used for all the assumptions, including the additional supply pool and an option which maintains the primary PTR at 15.4 – effectively retaining the COVID recovery teachers beyond this year.

Model Number	Base year of projections	Number of years data used to calculate Wastage and returns	Include temporary staff in wastage and returners	additional ITE students included to replenish supply	Primary PTR Fixed at 15.4 beyond 2020 to retain additional COVID teachers	Primary PGDE 2021	Secondary PGDE 2021	Primary PGDE average 2022-2025	Secondary PGDE average 2022 - 2025
1	2019	3	YES	-	-	550	1,600	400	1,200
2	2019	1	YES	-	-	750	1,650	600	1,250



3	2019	5	YES	-	-	450	1,700	300	1,300
4	2019	3	YES	12%	-	650	1,800	500	1,400
5	2019	3	YES	-	Yes	500	1,600	400	1,200
6	2019	3	-	-	-	550	1,550	400	1,150
7	2018	3	YES	-	-	250	1,550	100	1,200

---

Across these assumptions the range of primary PGDE students required for the 2021 intake is 250-750. For the Secondary PGDE the range is 1,550 to 1,800.

Model Number	Description (changes from baseline model)
1	Baseline Model – assumptions as detailed in section 2
2	1 year of data used to determine wastage and returners rates
3	5 years of data used to determine wastage and returners rates
4	An additional 12% of ITE students are trained added to replenish supply pool (beyond those accounted for in wastage rates)
5	Primary PTR fixed at 15.4 (assumes additional Covid-19 recovery teachers are retained beyond 2020)
6	Wastage and returner rates do not take account of temporary staff
7	Models and assumptions based on 2018 data (with rates based on the 3 years up to 2018)