



Department
for Education

2015/16 Teacher Supply Model User Guide

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Glossary of key terms

- **NCTL:** National College for Teachers and Leadership.
- **ITT:** Initial Teacher Training.
- **PTR:** Pupil Teacher Ratio.
- **DTR:** Database of Teacher Records.
- **PGCE:** Postgraduate Certificate of Education.
- **SWFC:** School Workforce Census.
- **FTE:** Full Time Equivalent. A teacher who is employed as a full time teacher is assumed to have a 1.0 FTE rate. A teacher who is employed as a part time teacher and works 50% hours is assumed to have a 0.5 FTE rate.
- **MFL:** Modern Foreign Languages.
- **Wastage:** The rate of teachers in publicly-funded schools leaving the profession. This includes teachers leaving to teach outside of England, in independent schools, special schools, Pupil Referral Units or other school settings not included in the model. It also includes those teachers leaving to other professions or to become economically inactive. It does not include those leaving through deaths in service, barrings from service, or those taking maternity breaks.
- **NQT:** Newly Qualified Teacher.
- **Newly Qualified Teacher entrants:** Teachers entering the active stock in the year following ITT.
- **Deferred entrants:** Teachers entering the active stock in the year after the year following ITT, i.e. entrance to the active stock is deferred or delayed by a year.
- **Re-entrants:** Teachers entering the active stock having taught previously¹. They may have been recorded teaching previously; either within or outside of the state-funded schools sector. They may also be completely new to the state-funded sector².
- **State-funded schools sector:** For the purposes of the TSM, the state-funded schools sector are teachers working in regular roles (i.e. non supply) in state-funded nursery, primary, or secondary schools in England. Academies and free schools are also included. For the purposes of the TSM, state-funded special schools or Pupil Referral Units are *not* counted as being in the state-funded schools sector.
- **Active stock:** The number of qualified teachers employed in regular roles (non-supply) in the state-funded schools sector as defined by the TSM (see above).

¹ As recorded on the DTR.

² Having only previously taught in independent schools for example.

Section 1: The Teacher Supply Model user guide

This user guide provides information to help the public understand the 2015/16 Teacher Supply Model (TSM) and use scenario testing that is made available to model users.

Overall, this user guide explains:

- The **data** that is used in the 2015/16 Teacher Supply Model.
- Which **data sources** are used.
- What **assumptions are used to produce the data** that feeds into the model.
- How the model is **structured**.
- How the model calculates:
 - The **teacher need** (the number of teachers needed in the active stock³ each year),
 - The **entrant teacher need** (the number of teachers required to enter into the active stock each year by all entrance routes into the profession),
 - The **Newly Qualified entrant teacher need** or **NQT entrant teacher need** (the number of Newly Qualified Teachers required to enter into the active stock in the 2016/17 academic year to meet the needs of the system), and,
 - The **Initial Teacher Training trainee need** or **ITT trainee need** (the no. of ITT places required in the 2015/16 academic year to generate this number of NQTs entering into the active stock in 2016/17).
 - This ITT trainee need is the **output** of the 2015/16 Teacher Supply Model. This feeds into the NCTL allocations model to allocate ITT places.
- The **assumptions** used within the model to make key calculations.
 - The model makes assumptions to estimate the number of new teachers required in the future and how many training places are required to meet this need.

For example, the model assumes how the size of the active stock of teachers will change over time with changing pupil numbers.

³ The no. of qualified regular teachers in state-funded nursery, primary, and secondary schools (including academies and free schools).

These assumptions are not *policies*, they are simply *predictions* of what we might expect to happen in the future given what has happened in the past based on the most reliable and up-to-date information we have available.

- **Scenario testing** that can be undertaken within the model and how model users can use it.
 - For example, the model allows users to test different teacher wastage rate scenarios and to examine the impact that these different wastage scenarios might have on the number of teachers required in future.
 - In other words, what impact would higher wastage rates have on the outputs of the model?

This user guide supports the 2015/16 Teacher Supply Model.

A technical description of the 2014/15 Teacher Supply model was published in January 2014⁴.

⁴ Document available at <https://www.gov.uk/government/publications/teacher-supply-model-a-technical-description>

Section 2: The overall structure of the Teacher Supply Model

2.1 The two parts of the 2015/16 Teacher Supply Model

The Teacher Supply Model is a statistical model that seeks to predict the future national need for teachers. It is used to inform Government decisions about the allocation of funding and places for Initial Teacher Training at a national level. Actual decisions about the employment and deployment of teachers at a school level fall under the responsibility of schools themselves.

The 2015/16 Teacher Supply Model (TSM) is structured in two distinct parts:

- **Part One** of the model estimates the **teacher need**, the number of teachers required in the active stock⁵ each year.

Part One then uses this teacher need to estimate the **entrant teacher need**, the number of teachers required to enter into the active stock each academic year by all entrance routes⁶ into the profession.

This estimation is made using assumptions as to the number of leavers⁷ expected each academic year and how the population of teachers (the size of the active stock) will change over time.

For more details on Part One of the 2015/16 TSM, see **Section 3**.

- **Part Two** of the model takes the number of teachers needed to enter the active stock each academic year from Part One and estimates the **NQT entrant teacher need** for the 2016/17 academic year⁸.

This NQT entrant teacher need is the number of Newly Qualified Teachers (NQTs) required to join the active stock in 2016/17 to meet the teacher need estimated in Part One⁹.

⁵ The no. of qualified regular teachers in state-funded nursery, primary, and secondary schools (including academies and free schools).

⁶ This includes deferred entrants and re-entrants as well as those that are newly qualified teachers.

⁷ Teachers leaving the active stock as either: wastage, retirements, deaths in service, or leaving through being barred from service.

⁸ ITT trainees completing training in 2015/16 will only be able to enter the active stock as qualified teachers in 2016/17 at the earliest.

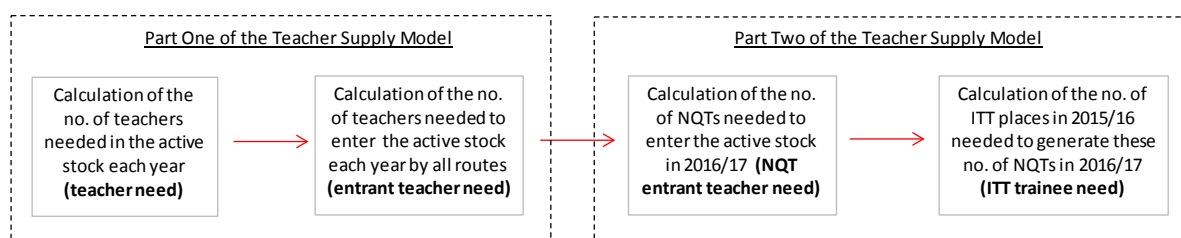
⁹ Given the number of teachers expected to enter by non NQT routes (e.g. as re-entrants and deferred entrants).

Part Two then estimates the **ITT trainee need**, the no. of ITT (Initial Teacher Training) places required (in the 2015/16 academic year) to generate this number of NQTs entering into the active stock in 2016/17¹⁰. This conversion is made by making assumptions as to how many trainees are expected to not complete their courses or not go into employment post ITT¹¹.

For more details on Part Two of the 2015/16 TSM, see **Section 4**.

Figure 1(see below) provides an illustration of how the two parts of the Teacher Supply Model feed into one another and the key calculation steps made along the way. All calculation steps are made for each phase and subject independently.

Figure 1: Overall structure of the Teacher Supply Model



Both parts of the model have **scenario testing capability** allowing users to test the impact of altering some of the assumptions that feed into the model on the outputs calculated. The scenario testing available within the model is outlined below. trainee

- In **Part One of the model**, scenario testing covers:
 - Future teacher wastage rates by gender.
 - Projections of pupil population.
 - Projections of how the active teacher stock (via the Pupil Teacher Ratio) will change as pupil populations change.
 - The scenario testing in Part One enables users to examine the impact on both the teacher need and entrant teacher need of changing these scenarios.
 - Comparisons are made to the Part One outputs¹² derived using *central or default* scenarios (these are the most likely scenarios)

¹⁰ The TSM only calculates the number of ITT trainees required to both start and complete ITT in 2015/16.

¹¹ These trainees may not go into teaching at all, defer their entrance into the active stock, or enter into teaching in another sector (e.g. in Wales/Scotland, in a supply role, in an independent school, in a special school etc).

¹² Both teacher need and entrant teacher need.

expected and are the values used to derive the *actual* model outputs used by Part Two).

- For more detail on scenario testing made available within Part One of the TSM, see **Section 5**.
- In **Part Two of the model**, scenario testing covers:
 - The proportions of re-entrants expected among the entrants to the active stock.
 - The scenario testing in Part Two enables users to examine the impact of different re-entrant¹³ rates on the ITT trainee need.
 - For more detail on the scenario testing made available within Part Two of the TSM, see **Section 6**.

2.2 The scope of the Teacher Supply Model

Table 1 (below) illustrates what is and is not included within the 2015/16 Teacher Supply Model.

Table 1: What is and is not included within the 2015/16 Teacher Supply Model

Included	Excluded
England.	Scotland, Wales, and Northern Ireland.
<i>Qualified</i> teachers (i.e. teachers with QTS)	<p><i>Unqualified</i> teachers are excluded from all teacher flows calculations & rates¹⁴.</p> <p>Unqualified teachers are also excluded from all entrant teacher need, NQT entrant teacher need, and ITT trainee need calculations.</p> <p>Qualified Teachers who are working as <i>supply</i> teachers are considered as teaching</p>

¹³ Re-entrants are those teachers who join the active stock having previously been recorded as:

- Teaching outside of the English state-funded schools sector (e.g. in Wales, in an independent school etc),
- Teaching in supply roles, or
- Not teaching at all, having taught previously.

¹⁴ The model assumes that the proportion of the active stock going forward that will be unqualified will be constant.

	<i>outside</i> of the active stock.
State-funded primary (including maintained nurseries attached to schools) and secondary schools, academies and free schools.	Special schools, Pupil Referral Units, Early Years, Independent schools, and Sixth Form Colleges. Qualified Teachers who are teaching in such schools are considered as teaching <i>outside</i> of the active stock for the purposes of the TSM ¹⁵ .
Teaching at Key Stage 5 in secondary schools.	Teaching at Key Stage 5 in standalone Sixth Forms Colleges.

Table 2: The subject groupings as used in the Teacher Supply Model

The subject groupings as used in the 2015/16 Teacher Supply Model are as follows:

Subject title	<i>Additional subjects included within (if appropriate)</i>
Art & Design	
Biology	
Business studies	
Chemistry	
Classics	
Computing	<i>includes similar subjects such as computer science</i>
Design and Technology	<i>includes D & T, engineering, resistant materials</i>
Drama	
English	<i>covers both language and literature</i>
Geography	
History	
Maths	
MFL	<i>includes French, German, and Spanish among others</i>
Music	
Others	<i>includes citizenship, dance, economics, food technology, graphics, media studies, null, other, other humanities, other social studies, other tech, psychology, social sciences, textiles etc</i>
PE	
Physics	
RE	

¹⁵ The TSM assumes that some qualified teachers will do something other than teach in the state-funded schools sector. All such teachers are handled in the same way within the TSM irrespective of whether they are economically inactive, teach in Wales or Scotland, or teach in sectors other than state-funded primary and secondary schools.

Section 3: Part One of the Teacher Supply Model

Section 3 of this user guide describes:

- What Part One of the 2015/16 Teacher Supply Model (TSM) does,
- The structure of Part One of the 2015/16 TSM,
- The data which feeds into Part One of the 2015/16 TSM,
- The assumptions used to produce this data, and
- The calculations used (and the assumptions behind them) by Part One of the TSM (at a high level) to calculate the teacher need and entrant teacher need by both phase and subject.

3.1 What does Part One of the Teacher Supply Model do?

As outlined in Section 2, Part One of the Teacher Supply Model estimates the **teacher need**, the number of teachers (as a headcount) required in the active stock each year. This is estimated for both the primary & secondary phases using projected pupil populations by phase and assumptions regarding how the PTR (Pupil Teacher Ratio) will change over time.

This *assumed* PTR is used to estimate how many teachers are required in the active stock each academic year going forward¹⁶. The assumption is *not* a departmental policy on future PTRs, it is only an *estimation* as to how the PTR will change given historical data and trends.

The secondary active stock is then broken down by subject by using assumptions as to how much time (proportionately) is spent teaching the different subjects by the total secondary active stock¹⁷.

These teacher need values are then utilised to estimate the **entrant teacher need**. This is the number of teachers required to enter into the active stock each academic year by all entrance routes¹⁸ into the active stock. To do this, the model uses the following formula for year, x :

¹⁶ As the projected no. of pupils going forward has already been calculated using the Pupil Projections Model.

¹⁷ E.g. if the secondary teaching stock spends 10% of its' total teaching time teaching English, 10% of the secondary teaching stock would need to be English teachers.

¹⁸ This includes deferred entrants and re-entrants as well as those who are newly qualified.

$$\text{'Need' for entrant teachers in year } x \text{ (Entrant need)} = \text{Teacher need in year } x -$$

$$\text{Stock of teachers at the end of previous year} +$$

$$\text{No. of teachers expected to leave in year } x$$

Therefore the model assumes that the entrant teacher need for a particular academic year is equal to:

1. The no. of additional/fewer teachers that might be required compared to the stock from the previous academic year (e.g. because pupil no.s have increased/decreased or there have been curriculum changes) *and*,
2. The no. of teachers that are expected to leave the active stock in that academic year (and require replacement).

As part of this calculation process, the model must make an estimation of the number of leavers from the active stock expected each academic year. This estimation is made using assumed projected wastage, retirements, deaths in service, and barrings from service leaver rates.

Additionally, to reflect the effect of the ever-changing characteristics and size of the active stock, the model makes assumptions on:

1. How the size of the active stock changes over time, and
2. The number & characteristic breakdowns of those entering and leaving the active stock each academic year.

The entrant teacher need output of Part One of the TSM plays directly into Part Two of the model.

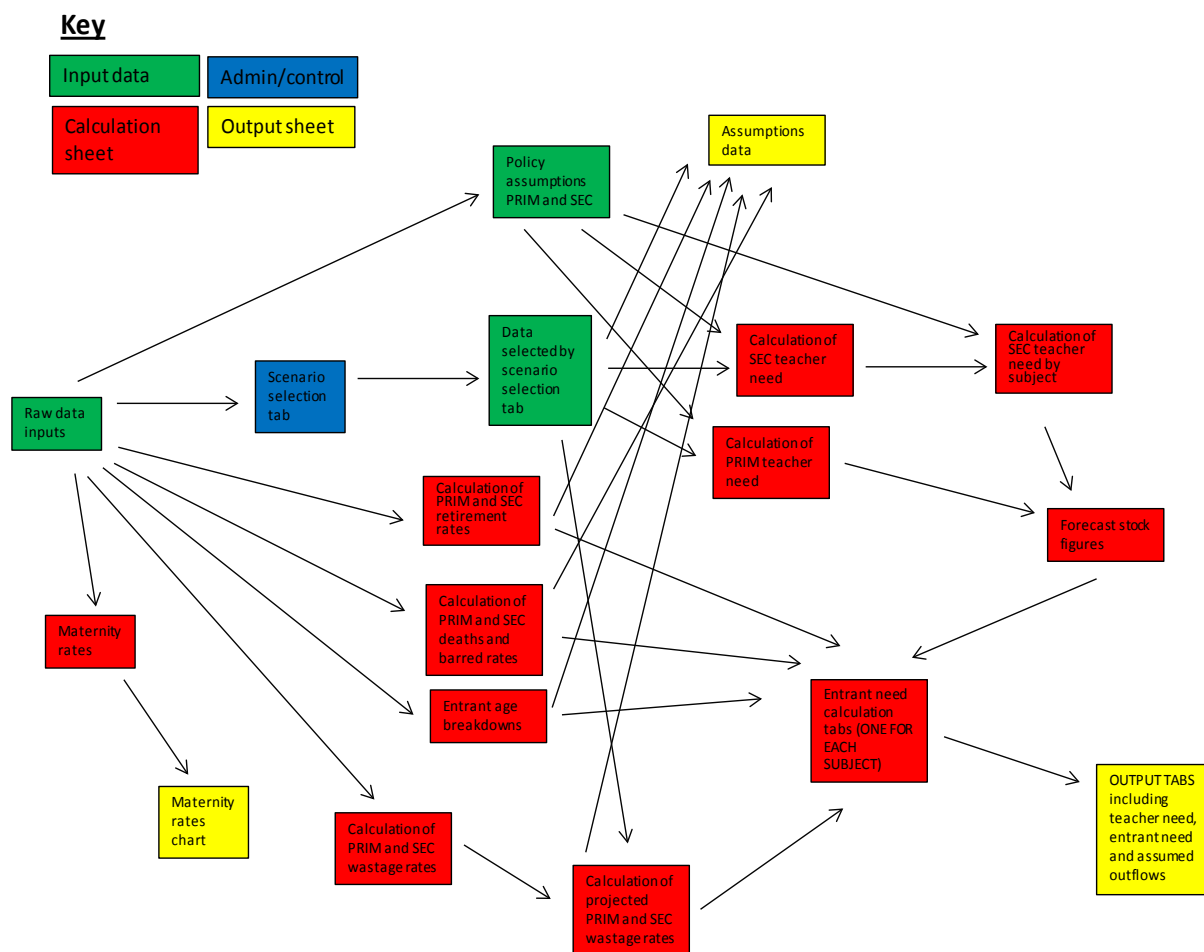
3.2 Structure of Part One of the Teacher Supply Model

Each tab in the model workbook includes information at the top as to where data is sourced from and which tabs it feeds into.

Additionally, a model map is provided on the '**map of sheets**' tab showing which tabs feed into which and how the overall model is structured. This map is presented below as Figure 2.

Table 3 (see A.1 in the Annex) provides a description of each tab within Part One of the 2015/16 TSM and what that tab does.

Figure 2: Map of Part One of the Teacher Supply Model



3.3 The data that feeds into Part One of the Teacher Supply Model?

The following data sources feed into Part One of the Teacher Supply Model:

- **Pupil Population Projections** from the **Pupil Projections Model** by Key Stage.
 - Pupils studying at Key Stage 5 in secondary schools are also included.
- **Teacher leavers and entrants data** from the **Database of Teacher Records**.
 - Teachers leaving the active stock as wastage¹⁹, retirements, deaths in service, and teachers being barred from service.

¹⁹ Wastage covers teachers leaving the active stock to teach in supply roles, teach in sectors outside of the state-funded schools sector in England, work in other non-teaching sectors, and those that become economically inactive. Teachers on maternity breaks are not classed as wastage.

- Data on the characteristics (age group and gender) of entrants to the active stock by all entrance routes²⁰.
- **Teacher stocks data** from the **School Workforce Census 2013** including data on:
 - Teachers' characteristics (age group and gender).
 - Secondary subject timetable information (what subjects secondary teachers are teaching at each Key Stage and for how many hours).
 - Teachers' Full-time Equivalent (FTE) rates²¹.
 - Teachers' qualification status²².
- **Projected teacher wastage** rates from the **Econometric Wastage Model**
 - Data projecting how teacher wastage rates²³ are likely to change going forward.

All data inputs into Part One of the model are provided in the '**raw data inputs**' tab in the model workbook.

The department's standards for data suppression require that fields relating to fewer than five individuals should not be published. In the department's statistical publication this is achieved by replacing figures based on fewer than 5 individuals with an "x". That approach does not work in the TSM as it would suppress the entire function within the model. To overcome this - and still apply the department's suppression rules - fields with fewer than 5 individuals have been aggregated either across gender or age bands. The effect of this is to decrease the total entrant teacher need for 2016/17 by **three teachers** compared to the actual outputs produced and used within the department.

More information on the data sources used in the Teacher Supply Model can be found within **Section 7**.

3.4 Data and assumptions on the current stocks of teachers

Calculations relating to the current stock of teachers are made on the '**stock calculations**' and '**stock ages breakdowns**' tabs.

²⁰ Including those entering as NQTs, deferred entrants, and re-entrants.

²¹ A teacher who is employed full-time is classed as 1.0 FTE, a teacher who is employed part-time and works 50% hours is 0.5 FTE.

²² Whether teachers are qualified or unqualified.

²³ Proportion of the active stock leaving in a given academic year as wastage.

School Workforce Census (SWFC) 2013 data is used to provide information on the *current* stock of teachers²⁴ by headcount. The census provides a snapshot of the active teacher stock in state-funded schools in England on census day in November 2013. The Teacher Supply Model assumes that the active stock as of November 2013, will be the active stock that will end the 2013/14 academic year.

The census provides information on teachers' gender and age group, whether teachers are qualified or unqualified and teachers' Full-time Equivalent rates.

Secondary teachers are also broken down by their **subject** specialism. Within the census, teachers are *not* identified as 'belonging' to a particular subject e.g. teacher x 'is' a biology teacher. The census simply provides information on teachers' qualifications²⁵ and timetable²⁶ information. Additionally, the census does not provide any information on any additional training that teachers may have received to teach additional subjects, e.g. a training course to enable a geography teacher to teach maths effectively.

As teachers may teach subjects other than those that they are most highly qualified in or hold a PGCE in, teachers are assigned to subjects according to how much time they spend teaching particular subjects. This assumption is designed to reflect what is happening within schools and how teachers are actually being utilised.

For example, if a teacher teaches maths 100% of the time, they are assumed to be 1.0 of a maths teacher. If they teach maths 50% of the time and physics 50% of the time they are assumed to be 0.5 of a maths teacher and 0.5 of a physics teacher. These values are not adjusted to account for teachers' Full-time Equivalent rates.

Data from the School Workforce Census is published as part of the School Workforce Statistical First Release²⁷. Some headcount figures may appear to differ slightly to those used within the Teacher Supply Model. These differences are the result of the active stocks used in the Teacher Supply Model having different selection criteria to those presented within the SFR due to modelling reasons (for example, different subject groupings and coverage).

²⁴ In the state-funded schools sector only.

²⁵ The highest post A level qualification that a teacher holds in that particular subject.

²⁶ The number of hours that an individual secondary teacher teaches in each subject at Key Stage 3, 4, and 5 respectively.

²⁷ School Workforce Statistical First Release available at <https://www.gov.uk/government/statistics/school-workforce-in-england-november-2013>

3.5 Data and assumptions on the number of teaching hours by subject

The School Workforce Census is used to provide data on how many hours are being taught in which subjects at Key Stage 3, 4, and 5 in secondary schools by both the *total* secondary active stock and *individual* secondary teachers. The subjects are defined as illustrated in Table 1 in Section 2.2.

Data that is similar to this on the *total* number of hours taught for particular subjects in secondary schools is included within the School Workforce Statistical First Release and may show some slight differences to those figures used within the TSM (see Section 3.4).

Additionally, it is worth noting that the TSM completely *excludes* hours spent teaching PSHE (Personal Social and Health Education). This assumption is made to prevent the model overestimating the number of PSHE teachers required (and the number of trainees requiring PSHE ITT). This assumption was made to reflect that the overwhelming majority of PSHE teaching is carried out by non-PSHE specialists e.g. teachers of other subjects teaching PSHE to their tutor groups 1-2 hours a week.

3.6 Data and assumptions on pupil projections

Calculations relating to pupil projections inputs are performed on the '**pupils data scenarios**' tab.

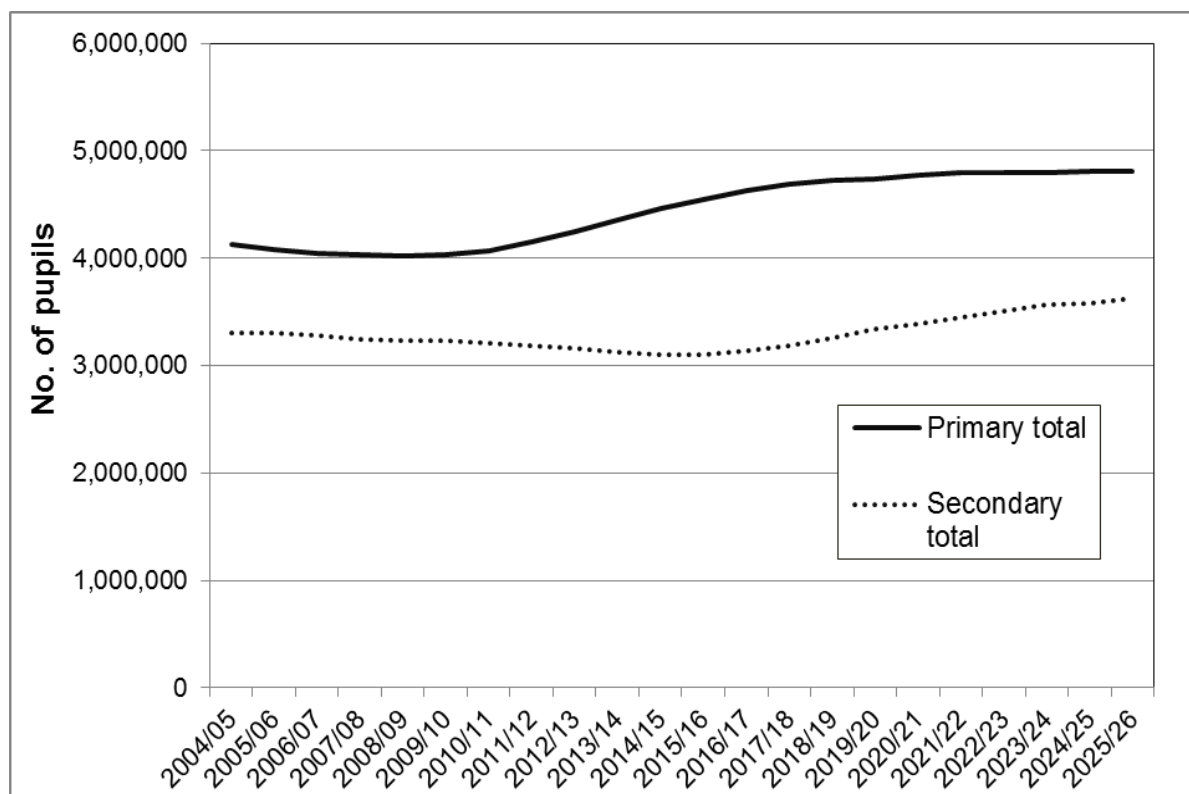
The change in the size of the pupil population going forward at each Key Stage is estimated using the outputs derived by the Pupil Projection Model which are used in the Department's published national pupil projections²⁸. High, central, and low scenarios of projected pupil population are derived for use in the TSM using variations of birth rate and migration projections.

The pupil projections model does not currently forecast how the no. of Key Stage 5 pupils in state-funded schools will change over time. Because these projections *are* required by the Teacher Supply Model, the TSM assumes that the no. of Key Stage 5 pupils in secondary schools will change at the *same* year-on-year rate as the national 16-19 population (projections on changes to the national 16-19 population *are* provided within the pupil projections model).

Pupil population projections data for the total primary and secondary phases as used by the TSM is illustrated in Figure 3 (see below).

²⁸ These were last published in July 2014. For more detailed figures and background information, please see the release available at <https://www.gov.uk/government/statistics/national-pupil-projections-trends-in-pupil-numbers-july-2014>

Figure 3: Pupil population projections data as used in the 2015/16 TSM broken down by phase.



3.7 Teacher flows data from the Database of Teacher Records

Data from the Database of Teacher Records (DTR) is used in both Part One and Part Two of the Teacher Supply Model to provide information on *historical* teacher flows, i.e. teachers leaving and entering the stock in previous years.

DTR flows data provides information about:

- The *characteristics* of leavers and entrants (gender and age group).
 - The DTR provides information on teachers' phase but *not* their subject specialisms (both which subjects they are qualified in and which subjects they teach).
- The *origin* of entrants.
 - E.g. are entrants NQTs, deferred entrants or re-entrants.
- The *destination* of leavers.

- E.g. have they retired, left as wastage²⁹, died in service.
- All DTR flows data is in headcount form.

Data on historical teacher flows is available up to 2011/12 (however, data for 2010/11 and 2011/12 remains provisional). In light of DTR data post 2010/11 being provisional, the model uses weighted³⁰ averages of the four most recent years of data for *all DTR related calculations*.

DTR data is a snapshot taken on the 31st March of each year. As a result, historical flow rates (e.g. the wastage rate) are calculated as being the proportion of the active stock of qualified teachers that leave between 31st March of a particular year and 31st March of the subsequent year.

For example, the wastage rate for the 2011/12 academic year is the proportion of the active stock on 31st March 2011 that leave as wastage between 31st March 2011 and 31st March 2012.

Rates are calculated for all age groups for both genders.

For consistency, the stock figures used to calculate such historical flow rates also come from the DTR. These stock figures may differ to the stocks calculated from the School Workforce Census because the two data sources are used for different purposes. The DTR is an off-shoot of the data used in the administration of the teachers' pension scheme (TPS) so will only cover teachers who are members of that scheme at the end of March each year³¹. The School Workforce Census covers teachers in publicly funded schools with a contract of more than 28 days and is collected in November.

Using the DTR for both stock and flow provides an internally consistent measure of wastage; that DTR based wastage rate is then applied to the stock of teachers as measured by the School Workforce Census.

The wastage numbers in the TSM may differ from those published in the School Workforce Census Statistical First Release (SFR) and are not directly comparable³². These differences are the result of different criteria, for example, the SFR and TSM have slightly different criteria for what is classed as the state-funded schools sector.

²⁹ Wastage covers teachers leaving the active stock to teach in supply roles, teach in sectors outside of the state-funded schools sector in England, work in other non-teaching sectors, and those that become economically inactive. Teachers on maternity breaks are not classed as wastage.

³⁰ A weighted average is used to account for the fact that the two most recent years of DTR data is provisional and subject to change. The model uses data from 2008/09, 2009/10, 2010/11, and 2011/12 with an average value being calculated which is weighted towards 2011/12.

³¹ Prior to January 2007, part-time teachers had to opt-in to (rather than opt-out of) the Teachers' Pension Scheme which affected the number of part-time teachers who were covered by the DTR.

³² For more information please see the SWF Statistical First Release available at <https://www.gov.uk/government/statistics/school-workforce-in-england-november-2012>.

In addition, the SFR wastage calculation includes those teachers who die in service or are barred from service. By contrast, the TSM only includes those who leave state-funded schools specifically as wastage.

All wastage, retirements, deaths in service, and barrings from service figures used in the TSM have been estimated separately³³ from fields in the DTR for modelling purposes in order to apply economic wastage estimates going forward (from the Econometric Wastage Model, see Section 3.9). The figures used by the TSM on deaths and barrings from service are not designed to be definite estimate of deaths and barrings from service.

3.8 Data and assumptions on historical and current wastage rates

Data on 'current' wastage rates (2011/12 and the three prior years) is calculated on the '**Calc PRIM wastage rates**' and '**Calc SEC wastage rates**' tabs for the primary and secondary phase respectively.

Data on historical wastage rates comes from the Database of Teacher Records (DTR).

The Teacher Supply Model estimates the proportion of the stock of teachers that will have left as wastage³⁴ (for each age group and gender) using a weighted³⁵ average of wastage rates from the previous four years of historical data. Values are calculated for the primary and secondary phases *combined* together³⁶.

Whilst the model calculates separate rates for the two genders³⁷, the model does *not* calculate different wastage rates for individual phases/subjects. This is a result of:

- The econometric wastage model³⁸ historically using wastage data³⁹ broken down by gender but not by phase of employment.
 - As a consequence, the econometric wastage model assumes that wastage rates for each gender are consistent across the phases.
- Subject specific wastage data being unavailable within the Database of Teacher Records.

³³ The TSM uses projected wastage rates from the Econometric Wastage Model which does not include deaths in service or barrings from service as wastage.

³⁴ In the most recent year for which we have data (2011/12).

³⁵ A weighted average is used to account for the fact that the two most recent years of DTR data is provisional and subject to change.

³⁶ The econometric wastage model used to project changes in the wastage rate (see Section 3.9) does not provide scalar forecast values for male and female teachers for the individual secondary and primary phases.

³⁷ There are noticeable differences in the likelihood of leaving the active stock as wastage between the two genders.

³⁸ Used to estimate projected wastage rates.

³⁹ The data used goes back to 1975.

As a consequence, if the wastage rate for the overall teaching stock of female teachers aged 30-34 is 2% for a particular year, the model assumes that 2% of female maths/physics/chemistry/history teachers aged 30-34 will leave as wastage in that year.

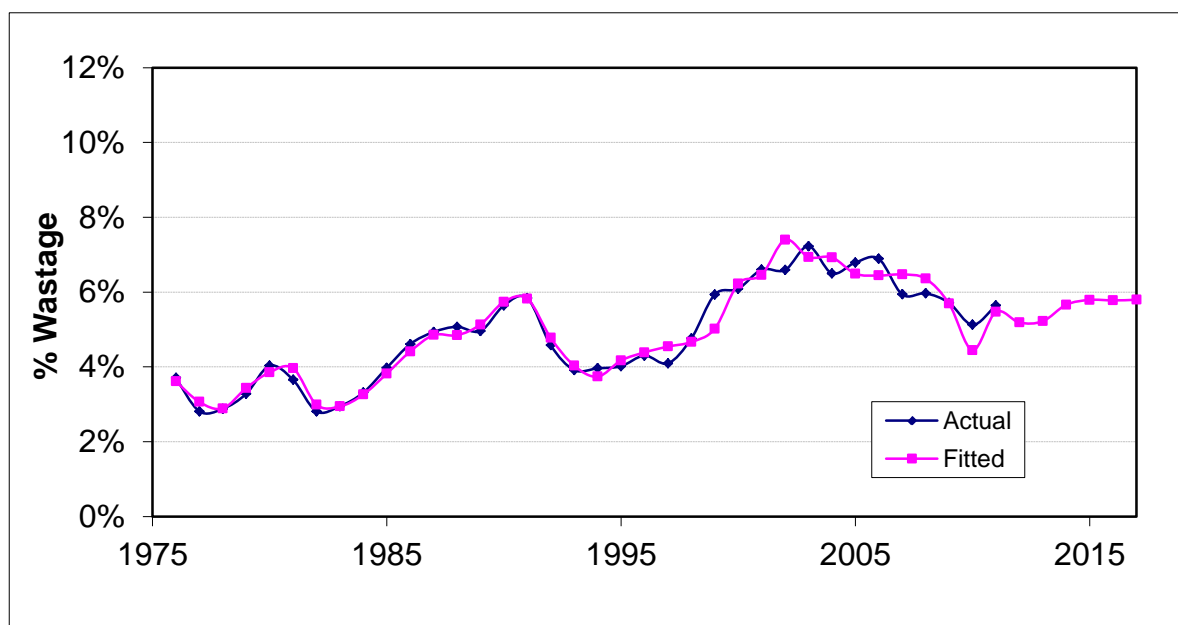
However, the stocks data in the model *does* take into account that subjects have different proportions of teachers who are male/female and within different age groups. Therefore, as the estimated wastage rates are different for each demographic group, the model estimates that different proportions of the stock will leave as wastage for the individual subjects⁴⁰.

Going forward, the Teacher Supply Model has been designed in such a way that if econometric wastage modelling by phase was to be carried out in future years (enabling the projection of future wastage for the respective phases separately), the model would only require a simple conversion to use this alternative approach.

3.9 Data and assumptions on projected wastage

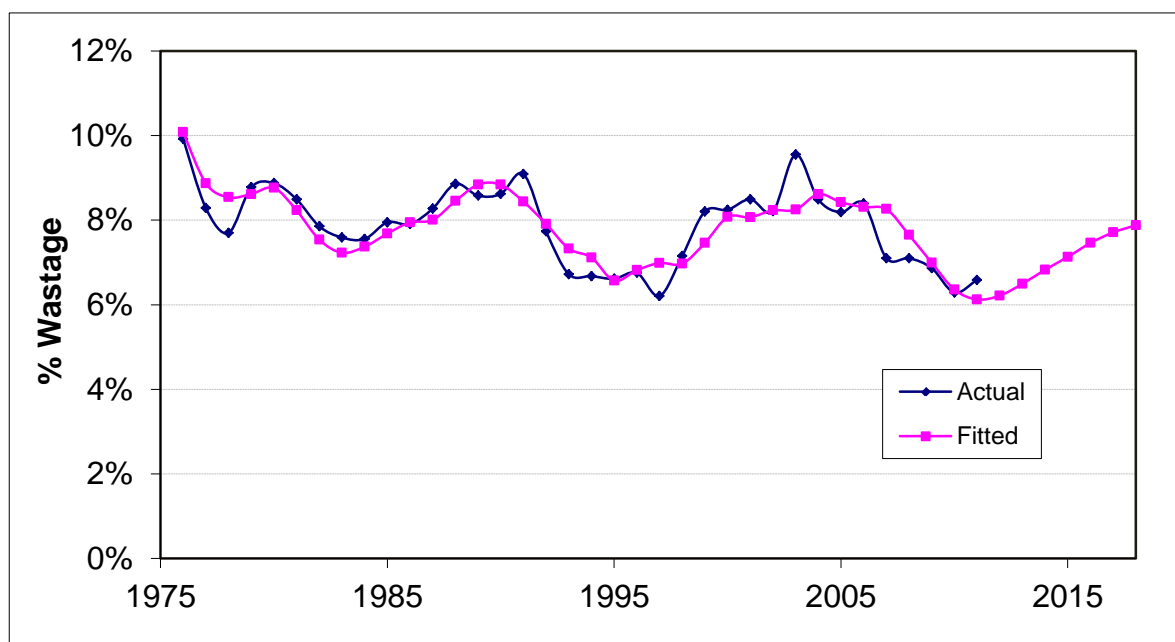
Having calculated wastage rates for 2011/12, the model then calculates *projected* wastage rates on the 'Projected PRIM wastage rates' and 'Projected SEC wastage rates' tabs.

Figure 4: The percentage of male teachers leaving as wastage (comparison of actual values from the DTR and fitted values from the Econometric Wastage Model)



⁴⁰ E.g. if the stock of maths teachers had fewer female teachers than the stock of drama teachers, a greater proportion of the maths stock might be expected to leave as wastage than from within the drama stock.

Figure 5: The percentage of female teachers leaving as wastage (comparison of actual values from the DTR and fitted values from the Econometric Wastage Model)



As wastage rates are quite variable over time⁴¹ (see Figure 4 and 5 above) forecasted changes in wastage rate are obtained using the internal **econometric wastage model**.

The econometric wastage model uses forecasts of economic growth and unemployment data to predict how the teacher wastage rate will change up to 2017/18 based upon historical relationships between wastage and these and other variables⁴².

The projected wastage rate is estimated from an economic regression analysis that considers the relationship between wastage and other key socioeconomic variables using time series data from 1975. Socio-economic factors that are considered to have a potential impact on teacher wastage include GDP growth, unemployment, and relative pay.

The projected wastage rate is estimated from an economic regression analysis that considers the relationship between wastage and other key socioeconomic variables using time series data from 1975. Socio-economic factors that are considered to have a potential impact on teacher wastage include GDP growth, unemployment and relative pay.

⁴¹ Teacher wastage is closely linked to ever changing economic and employment factors.

⁴² The econometric wastage model uses data from:

- The DTR on age-specific wastage (excluding retirements and deaths in service) and relative teacher pay,
- Data from the YBEZ series published by the Office for National Statistics on GDP Growth Rate,
- Data from the Office for Budget Responsibility (OBR) on GDP forecasts,
- data on comparison group of non-manual employees from ASHE, and
- Data from ONS on claimant count rate forecasts used to project unemployment rates.

The proportional change in the future wastage rates compared to that of 2011/12 is expressed by the econometric wastage model in the form of a scalar value for both genders for each future year. These scalar values are applied within the TSM to the wastage rate in 2011/12 to calculate how the wastage rate will change over time for both male and female teachers. The model assumes that the projected wastage beyond 2017/18 will remain constant.

These projected wastage rates are fed into the tabs for each individual phase and subject to estimate future wastage numbers for each phase and subject.

3.10 Data and assumptions on retirements

Calculations of retirement rates by phase are carried out on the '**Calc PRIM retirement rates**' and '**Calc SEC retirement rates**' tabs.

The model calculates retirement rates as being the proportion of the active stock of qualified teachers that leave the active stock (as retirements only) between 31st March of a particular year and 31st March of the subsequent year⁴³. Rates are calculated for all age groups for both genders.

For example, the retirement rate for the 2011/12 academic year is the proportion of the active stock on 31st March 2011 that leave as retirements between 31st March 2011 and 31st March 2012.

This retirement rate by age group and gender is then applied to the stock to calculate a no. of teachers leaving by retirement for each phase and subject.

For example, if the retirement rate for the overall secondary stock for female teachers aged 50-54 is 2% in 2011/12, the model assumes that 2% of female maths teachers aged 50-54 will leave as retirements in that year.

The model assumes that the secondary retirement rates are consistent across the subjects e.g. if the retirement rate for female maths teachers aged 50-54 is 2%, it is also 2% for female physics teachers aged 50-54. However, the current stocks data takes into account that some subjects have higher or lower proportions of teachers over the age of 50 which results in higher or lower proportions leaving by retirement.

The model also assumes that the primary and secondary retirement rates remain constant over time. However, as the model assumes that the proportion of teachers within different age groups will change over time, it also assumes that the proportion of the stock that will retire will also change over time.

⁴³ The Database of Teacher records is a snapshot from the 31st March of a given year.

The retirement rates are fed into the tabs for each individual phase and subject to estimate future retirement numbers for each phase and subject.

3.11 Data and assumptions on deaths in service and teachers barred from service

Calculations of death/barred rates by phase are carried out on the '**Calc PRIM death and barred rates**' and '**Calc SEC death and barred rates**' tabs.

The model calculates death/barred rates as being the proportion of the active stock of qualified teachers that leave (as deaths in service or barrings from service only) between 31st March of a particular year and 31st March of the subsequent year. Rates are calculated for all age groups for both genders.

For example, the death/barred rate for the 2011/12 academic year is the proportion of the active stock on 31st March 2011 that leave as deaths in service or barrings from service between 31st March 2011 and 31st March 2012.

This death/barred rate by age group and gender is then applied to the stock to calculate a no. of teachers leaving by deaths/barrings for each phase and subject.

For example, if the death/barred rate for the overall secondary stock for female teachers aged 50-54 is 0.2% in 2011/12, the model assumes that 0.2% of female maths teachers aged 50-54 will leave as retirements in that year.

The model assumes that the secondary death/barred rates are consistent across the subjects e.g. if the death/barred rate for female maths teachers aged 50-54 is 0.2%, it is also 0.2% for female physics teachers aged 50-54.

The model also assumes that the primary and secondary death/barred rates remain constant over time.

These death/barred rates are fed into the tabs for each individual phase and subject to estimate future death/barred numbers for each phase and subject.

3.12 How does the model estimate the required future stocks (the teacher need) of teachers by phase?

Part One of the Teacher Supply Model calculates the teacher need by phase on the '**Calculation primary teacher need**' and '**Calculation overall secondary teacher need**' tabs respectively.

The model does this by estimating how the Pupil Teacher Ratio (PTR) will change going forward as pupil numbers change. From this estimated PTR, the number of teachers required can be calculated.

Figure 6: Changes in pupil (FTE) numbers and Pupil Teacher Ratio (PTR) in primary schools 1979-2011

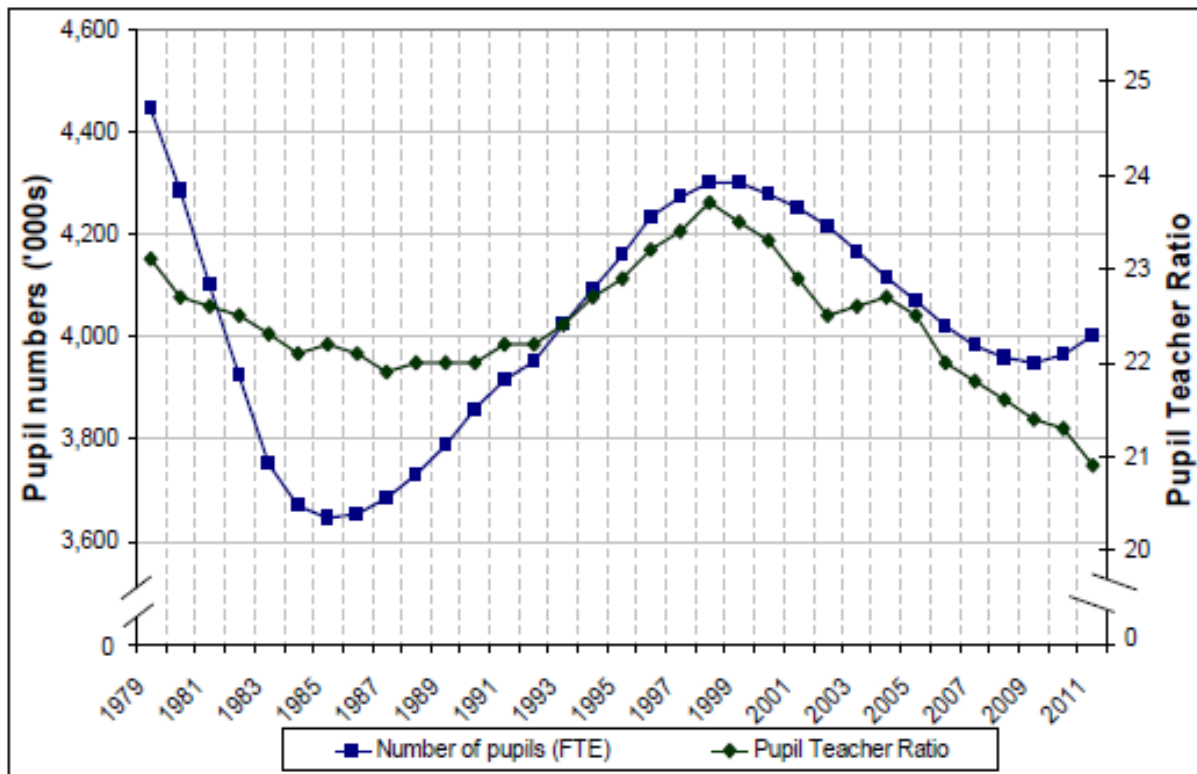
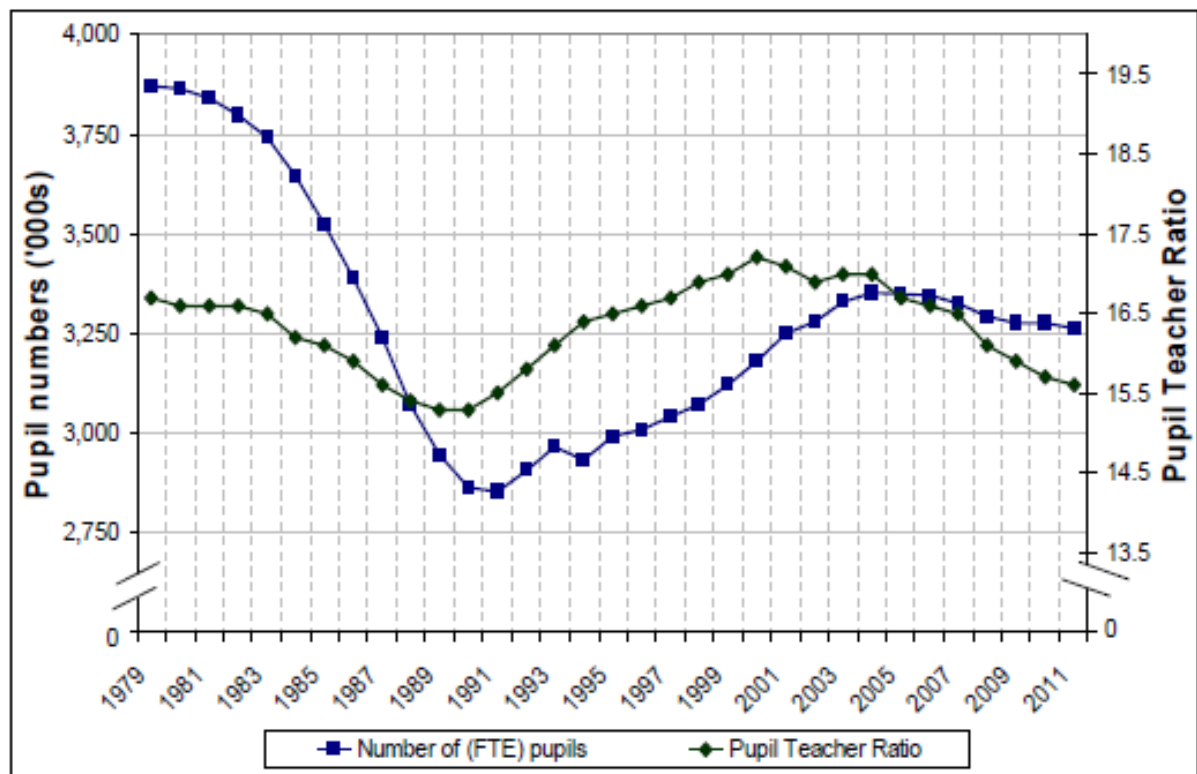


Figure 7: Changes in pupil (FTE) numbers and Pupil Teacher Ratio (PTR) in secondary schools 1979-2011



Historical trends of Pupil Teacher Ratio with changes in pupil FTE numbers from 1979-2011⁴⁴ can be seen in Figures 6 and 7 above for the primary and secondary phases respectively. These trends illustrate that as the pupil population has increased in the past, part of the additional need for teachers has been met by increasing class sizes (and therefore, PTRs).

The model assumes that, for an increase in pupil population of **1%**, the PTR will increase by **0.5 percentage points**⁴⁵ for the primary phase and **0.6 percentage points** for the secondary phase up to a maximum cap⁴⁶. Should pupil numbers increase such that the PTR would exceed this cap, teacher need increases such that the PTR will remain constant (at this cap).

This desired PTR for the system is used to calculate the no. of Full-time Equivalent (FTE) teachers required (the '**teacher need**').

The PTR caps to be used in the model are the **current PTR** (as calculated by the model) for the primary phase and **16** for the secondary phase (relating to the maximum PTR levels observed around the year 2000).

The current (November 2013) **ratio of unqualified to qualified teachers** is estimated by the TSM using SWFC data (by both phase and subject). This ratio is then applied to the FTE teacher need (by both phase and subject⁴⁷) to subtract the proportion of the teacher need that is assumed will be met by *unqualified* teachers in the future⁴⁸. It is assumed that this rate will remain constant going forward to reflect stability of the unqualified teacher rate in the SWFC and the approach used in the TSM historically.

The FTE teacher need is then converted into *headcount* teacher need by multiplying the FTE teacher need by the *FTE rate* for teachers. Values for the primary and secondary phase are calculated separately from the SWFC. It is assumed that these FTE rates will remain constant going forward.

The teacher need values by phase as calculated by the TSM are illustrated in Figure 8 (below). All figures are calculated using the central scenarios.

⁴⁴ Source of information <https://www.gov.uk/government/publications/class-size-and-education-in-england-evidence-report>.

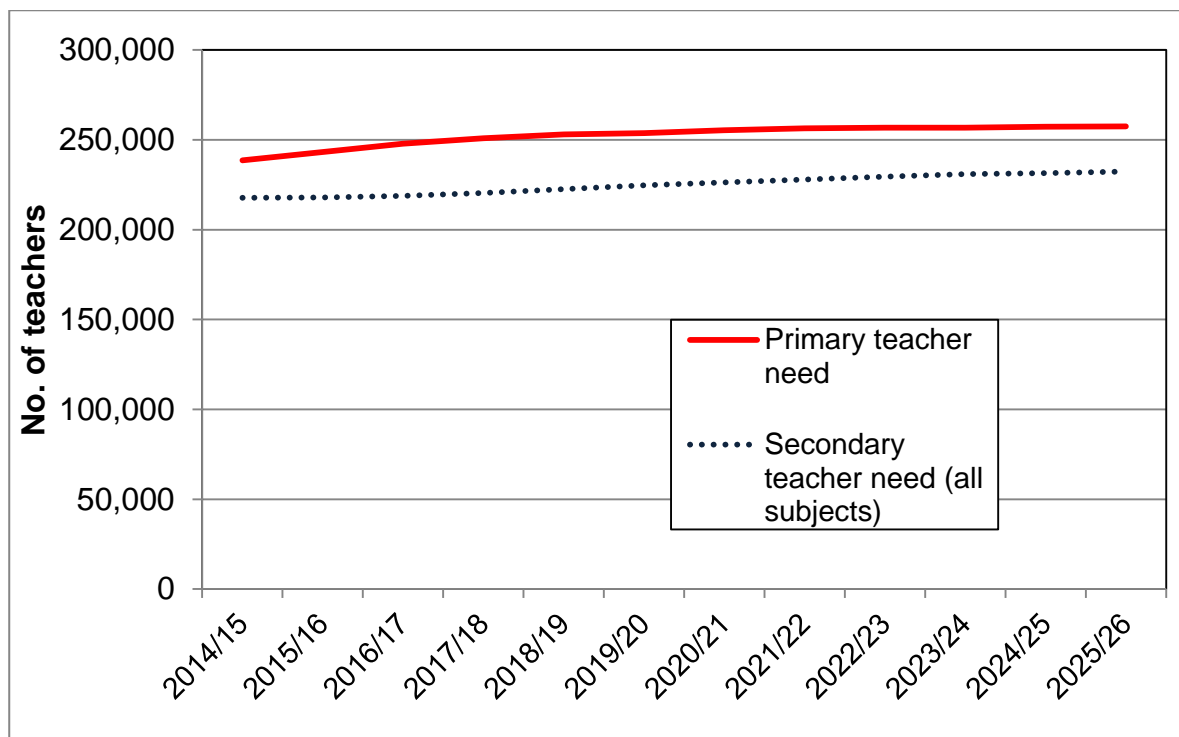
⁴⁵ Based on the rates of PTR increase observed in the late 1990s when pupil numbers were increasing noticeably.

⁴⁶ This is the approach that has been used in previous versions of the TSM and is based on historical increases of PTR with increasing pupil numbers.

⁴⁷ This calculation is performed on the 'teacher need by subject' tab for the secondary phase and takes into account that different subjects have proportionately more or less unqualified teachers than others.

⁴⁸ A similar approach is used to estimate the proportion of teacher need that will be met by centrally employed teachers.

Figure 8: Teacher need values by phase as calculated by the 2015/16 Teacher Supply Model



3.13 How does the model estimate the future stocks of secondary teachers by subject (i.e. the secondary teacher need by subject)?

Once the FTE teacher need for the *overall* secondary phase has been calculated, this figure can then be divided into the teacher need for individual subjects on the ‘**Teacher need by subject**’ tab.

At a high level, this works on the assumption that if 10% of the total teaching time of the secondary workforce is spent teaching English (for example), then 10% of the FTE secondary workforce needs to be English teachers. In other words, 10% of the secondary lessons are currently English lessons.

Unlike the previous model, the new model methodology only uses SWFC data on the amount of actual teaching time dedicated by the current workforce to each subject.

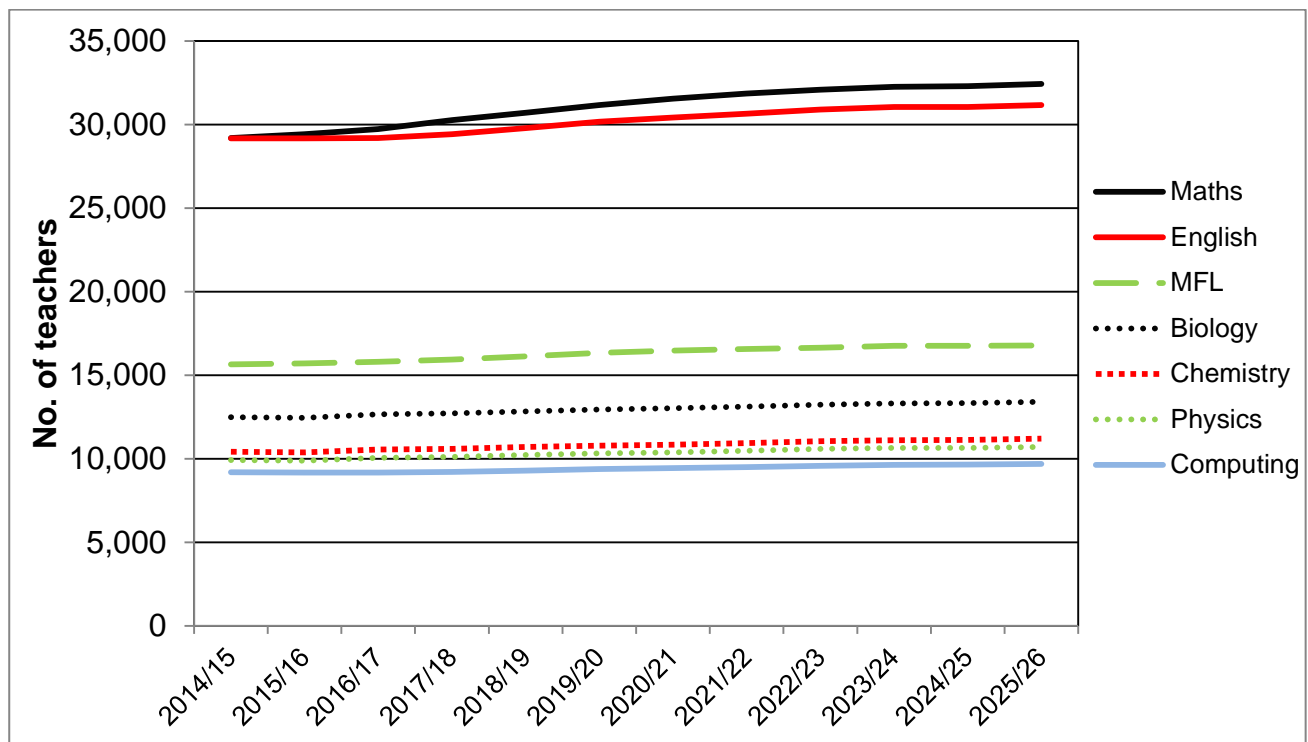
To reflect that different subjects are more/less popular at the different Key Stages, and that the proportion of the secondary pupil population at the different Key Stages is in flux, the model estimates the average quantity of teaching time required per pupil for each subject at KS3, 4 and 5 which is then multiplied upwards using projected pupil numbers

to take into account the changing teacher need for subjects as the pupil demographics change⁴⁹.

All secondary teacher need values are adjusted to account for the FTE rates of the secondary workforce and the proportion of teachers that are expected to be unqualified.

The teacher need values for some key subjects as calculated by the TSM are illustrated in Figure 9 (below). All figures are calculated using the central scenarios. Graphical representations of teacher need for all subjects as calculated by the model are available on the ‘**Teacher need charts over time**’ tab.

Figure 9: Teacher need values for some key subjects as calculated by the 2015/16 Teacher Supply Model



3.14 How does the model account for any additional need for teachers resulting from new teacher related policies?

If a teacher-related policy is expected to *increase* the future need for teachers (teacher need) by **more than 100 FTE teachers in 2016/17 or beyond**, a *policy assumption* (based on evidence) to increase teacher need could be added to the model⁵⁰.

⁴⁹ Different subjects require different amounts of average teaching time per pupil at KS3, 4 and 5. This is a result of different subjects being more/less popular at the different Key Stages. For example, business studies is far more popular at KS4 than KS3. Additionally, subjects such as social studies and psychology are considerably more popular at KS4 and KS5 than at KS3.

⁵⁰ This assumption could be made at either phase or individual subject level.

If a policy relates to the *training* of teachers, e.g. 100 teachers are to be trained by a new training route, an assumption in the TSM is *not* required as this policy does not affect the number of teachers required in the active stock.

There are no policies relating to the *overall need* for primary teachers or an additional requirement for more primary teachers within the active stock.

There are four secondary teacher related policies that would result in an increase in the number of teachers of particular subjects needed by more than 100⁵¹.

These assumptions are summarised on the '**Policy assumptions Secondary**' tab within the model. All four policies are expected to affect the popularity of particular subjects at particular points within the secondary education process (e.g. the introduction of EBacc will make some subjects more popular at Key Stage 4 than they were in the previous SWFC data).

Using this information, assumptions are made by the model as to how the proportion of the overall secondary teacher requirement at Key Stage 3, 4, or 5 might increase (and in what academic year those increases would occur) and are added into the '**Secondary need by subject**' tab.

Assumptions were added relating to the impact on teacher need of:

- **The introduction of EBacc and wider GCSE curriculum changes.**
 - The introduction of EBacc and wider GCSE curriculum changes have seen an increase or decrease in the no. of hours taught in some subjects at Key Stage 4.
 - Overall, the no. of hours taught at Key Stage 4 fell between Sept 2012 and 2013⁵². All subjects saw a fall in the no. of hours taught at KS4 except maths, English, MFL, geography and history.
 - However, the data only reflects the rolling out of EBacc on one year group of the Key Stage 4 cohort. A one off assumption for 2014/15 is required to reflect the roll out of EBacc to the *whole* KS4 cohort.
 - Going forward, future yearly updates of the TSM will employ the latest SWFC data available to reflect future changes in the quantity of teaching in different subjects at KS 3, 4, and 5. This will include assessing the impact of the new KS4 performance measure - Progress 8.

⁵¹ Following analysis carried out by the department.

⁵² To reflect lower pupil numbers.

- **Removal of the option to take just Core Science GCSE**

- The introduction of the new Combined Science GCSE, which will be equivalent to the current Core and Additional Science GCSEs, will remove the option to take the Core Science GCSE only. We are expecting that for 10% of KS4 students, their science teaching time will double from Sept 2016 onwards (as they change to the Combined Science GCSE).

- **Core Maths**

- Up to 40% of post 16 pupils could be studying a qualification which takes up similar teaching time of an AS level. Internal modelling has estimated the no. of additional KS5 maths teachers needed in state-funded schools by year.

- **Enhanced Further Maths Support Programme**

- The Enhanced Further Maths Support Programme will be active from March 2014 for 3 years. It is expected that this policy will result in continuing increases in the uptake of further maths and maths A level at roughly the same rate as currently, which will require more advanced level maths teachers.

3.15 How does the model estimate the number of teachers needed to enter the stock each year (the entrant teacher need)?

Part One of the TSM models the 'need' for entrant teachers by assuming that:

'Need' for entrant teachers in year x (Entrant need) = Teacher need in year x –

Stock of teachers at the end of previous year +

No. of teachers expected to leave in year x

Therefore the model assumes that the need for entrant teachers in a particular year is equal to:

1. The no. of additional/fewer teachers that might be required compared to the stock from the previous year (e.g. because pupil no.s have increased/decreased or there have been curriculum changes) *and*,
2. The no. of teachers that are expected to leave (and require replacement).

The entrant teacher need (by headcount) is calculated individually for each phase/subject on the relevant phase/subject tab. For example, the calculations for maths are on the

'**maths**' tab. The individual steps required in this calculation are summarised in Section 3.16.

3.16 The individual steps of calculating the entrant teacher need for each phase and subject.

Collated on the yellow output tabs at the end of the model (for all the different subjects and phases together) are both the entrant teacher need values plus any other values that are calculated by the model (e.g. the number of retirements as estimated and assumed by the model are collated on the '**No.s of retirements over time**' tab for example).

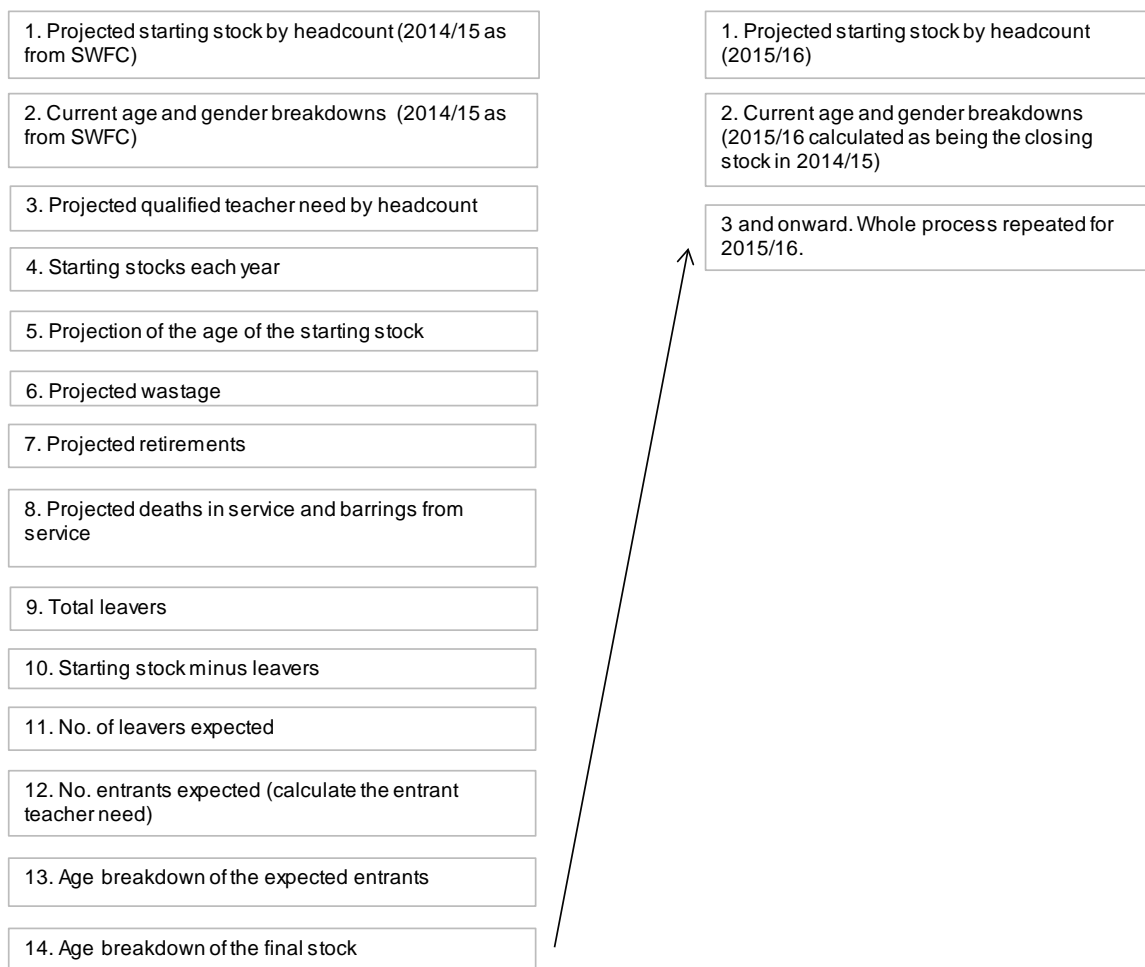
The entrant teacher need as provided on the '**OUTPUTS FOR PART 2**' tab is the output of Part One of the TSM and feeds directly into Part Two of the model.

Figure 10 below illustrates the process of calculating the entrant teacher need for each phase and subject. This process is carried out on an individual tab for each subject and phase (for example, all the maths calculations are performed on the '**maths**' tab, the primary on the '**primary**' tab etc). All figures calculated are in headcount form.

The calculation process is carried out for one academic year at a time. This is a result of the calculation of values for the 2015/16 academic year being dependent on all the values being calculated for the 2014/15 academic year first.

The process is described in more detail below using the 2014/15 academic year as an example. This process is carried out separately for all subjects and phases on the tab relating to that subject or phase.

Figure 10: The process of calculating the entrant teacher need values for each phase and subject within the 2015/16 Teacher Supply Model



1. Projected starting stock by headcount

The **starting stock for 2014/15** is the assumed closing stock from 2013/14, i.e. the *current* stock figures as provided by the 2013 SWFC (see Section 3.4 for more details).

Going forward, the model needs to make an assumption as to how the size of the starting stock will change. It does this by making a high level assumption that the state-funded schools system adapts to changing numbers of pupils over time by meeting the required *need* for teachers in each year (and thus achieving the desired/expected PTR of the state-funded schools system). The projected stock figures are calculated on the **'Forecast stock figures'** tab.

E.g. if the system requires 10,000 maths teachers in 2016-17, the system *will* recruit enough teachers to meet that teacher need. Therefore, the stock of maths teachers at the end of 2016-17 will be 10,000. *This* will be the starting stock for 2017-18.

In other words, the model assumes that **starting stock of a given year will be equal to the need of the year before.**

However, in order to calculate the future entrant teacher need, the model needs to make assumptions as to how the number of leavers will change over time (i.e. how many replacements will be required each year⁵³) and therefore how the characteristics of the active stock will change in future.

2. Current age and gender breakdowns

The model assumes that the current age and gender breakdowns (for 2014/15) will be the same as those in the closing stock for 2013/14. The model assumes that these stock figures are those given from the SWFC for the relevant subject/phase.

3. Projected qualified teacher need by headcount

These values are calculated by the model already by subject/phase projected into the long term future (see Section 3.12 and 3.13).

4. Starting stocks each year

The model assumes that the starting stock for 2014/15 is as the current age group and gender breakdowns.

5. Projection of the age of the starting stock

Demographic breakdowns of the *current* active stock are produced from the SWFC.

The active stock is broken down into 5 year age groups for each gender.

The model then makes an assumption as to how the stock naturally ages year-on-year⁵⁴.

6. Projected wastage

The model takes the stock from part 5 and assumes that a certain number of teachers will leave as wastage in 2014/15 using the assumed projected wastage rates for each academic year (see Section 3.9).

Different wastage rates are applied to the different genders and age groups.

7. Projected retirements

The model takes the stock from part 5 and assumes that a certain number of teachers will leave as retirements in 2014/15 using the assumed projected retirements rates for each academic year (see Section 3.10).

⁵³ As the demographics of the stock changes, so does the proportion that will leave as there are differences in the leaver rates of different age groups.

⁵⁴ Each year one fifth of each five year age group, 'moves up' to the age group above.

Different retirement rates are applied to the different genders and age groups.

8. Projected deaths in service and barrings from service

The model takes the stock from part 5 and assumes that a certain number of teachers will leave as deaths or barrings in 2014/15 using the assumed projected deaths/barred rates for each academic year (see Section 3.10).

Different deaths/barred rates are applied to the different genders and age groups.

9. Total leavers

The total number of leavers in 2014/15 (as assumed by the model) are added together and broken down by their gender and age group. The model has now calculated the numbers of teachers for that phase or subject that is expected leave in 2014/15.

10. Starting stock minus leavers

The stock that *started* the academic year 2014/15 now has the teachers expected to leave in 2014/15 subtracted away.

11. No of leavers expected

The total no. of leavers in 2014/15 by all leaver routes are added together.

12. The no. of entrants expected

The model now calculates the no. of entrants required in 2014/15 (the entrant teacher need for 2014/15).

This value is equal to the number of additional or future teachers needed in 2014/15 due to greater/fewer numbers of pupils *plus* the number of teachers expected to leave the stock in 2014/15.

13. Age breakdown of expected entrants

The model then assumes that this number of teachers will enter into the stock in 2014/15. In other words, the number of entrants in 2014/15 will be equal to the entrant teacher need 2014/15.

High-level assumptions are then made on the 2014/15 entrants' characteristics:

- The model assumes that the age group breakdown of entrants coming in is equal to the historical age group breakdowns of entrants (from all entrance

routes combined) from the four previous years⁵⁵ of DTR data (for each phase). These are calculated on the '**entrant age breakdowns**' tab.

- The gender balance of entrants is assumed to be the same as the current stock. For example, if 40% of physics teachers in the current stock are female, the model assumes that 40% of physics entrants will also be female.

14. Age breakdown of the final stocks

These entrants broken down by gender and age group for 2014/15 are then added to the stock calculated in part 10 to give the *closing* stock for the 2014/15 academic year.

The model assumes that this stock breakdown will be the *starting* stock breakdown for the subsequent year, 2015/16. The whole process now repeats itself.

The Teacher Supply Model in future years

Each year, *new* SWFC current stock data will become available and will be added to the model. This data will update the:

- PTR led teacher need calculations and how the ratios of pupils and teachers are actually changing over time given funding and accommodation capacity issues.
- FTE rates of the stock.
- The unqualified rates of the stock.
- Demographic breakdowns of the stock to reflect how they will change slightly over time.

⁵⁵ The data from the previous four years is weighted towards the most recent year. Data is available up to 2011/12, although data for 2010/11 and 2011/12 remains provisional. Data on the age of entrants is not available for individual subjects.

Section 4: Part Two of the Teacher Supply Model

Section 4 of this user guide describes:

- What Part Two of the 2015/16 Teacher Supply Model (TSM) does,
- The structure of Part Two of the 2015/16 TSM,
- The data which feeds into Part Two of the 2015/16 TSM,
- The assumptions used to produce this data, and
- The calculations used (and the assumptions behind them) by Part Two of the TSM (at a high level) to calculate the 2016/17 NQT⁵⁶ entrant teacher need and the 2015/16 ITT⁵⁷ trainee need by both phase and subject.

4.1 What does Part Two of the Teacher Supply Model do?

Part Two of the Teacher Supply Model takes the numbers of teachers (as a headcount) needed to enter the stock each year from Part One of the model and estimates the **NQT entrant teacher need** for 2016/17.

The model calculates the no. of NQT entrants required in a particular academic year using the following formula:

No. NQT entrants required in yr x (*NQT entrant need*) = 'Need' for entrant teachers in yr x (*entrant need*) -

No. deferred entrants expected in yr x (*deferred entrant need*) -

No. re-entrants expected in yr x (*re-entrant need*)

To do this, Part Two of the model needs to estimate the number of teachers expected to enter the active stock as **deferred entrants** or **re-entrants** in 2016/17.

- Deferred entrants are teachers who enter the active stock in the academic year after the academic year following ITT, i.e. they defer entry by a whole academic year.
- Re-entrants are teachers who enter the active stock having taught previously either within the state-funded schools sector or elsewhere⁵⁸.

⁵⁶ Newly Qualified Teacher.

⁵⁷ Initial Teacher Trainee.

⁵⁸ These teachers will include those who are teaching outside of the English state-funded schools sector, those who are teaching in supply roles, or returning to teaching having last been recorded in the DTR as

The NQT entrant teacher need is the number of NQTs required to enter into the active stock in the 2016/17 academic year to meet the teacher need estimated in Part One.

The model estimates the proportions of entrants entering the active stock via the different entrant routes (NQT, deferred, and re-entrant) using historical entrants data from the Database of Teacher Records (DTR).

Entrant teachers are *not* all employed as full-time teachers with a Full Time Equivalent (FTE) value that is equal 1.0. Additionally, the FTE values of entrant teachers may be lower/higher than that of the overall active stock.

To account for this, Part Two of the model calculates the total FTE number of teachers entering by each entrance route and scales this number to ensure that this is *equal* to the total FTE number of entrant teachers required as calculated by Part One.

Using the NQT entrant teacher need values, Part Two of the model then estimates the **ITT trainee need**. This is the no. of ITT places in 2015/16 required to generate this number of NQTs entering into the active stock in 2016/17. This conversion is made by making assumptions as to how many trainees are likely to complete their courses and go into employment in the state funded schools sector post ITT.

The ITT trainee need calculated only covers those trainees both starting and completing ITT in 2015/16. This figure feeds into the NCTL allocations model. Places for Teach First are included within this overall ITT trainee need figure.

4.2 Structure of Part Two of the Teacher Supply Model

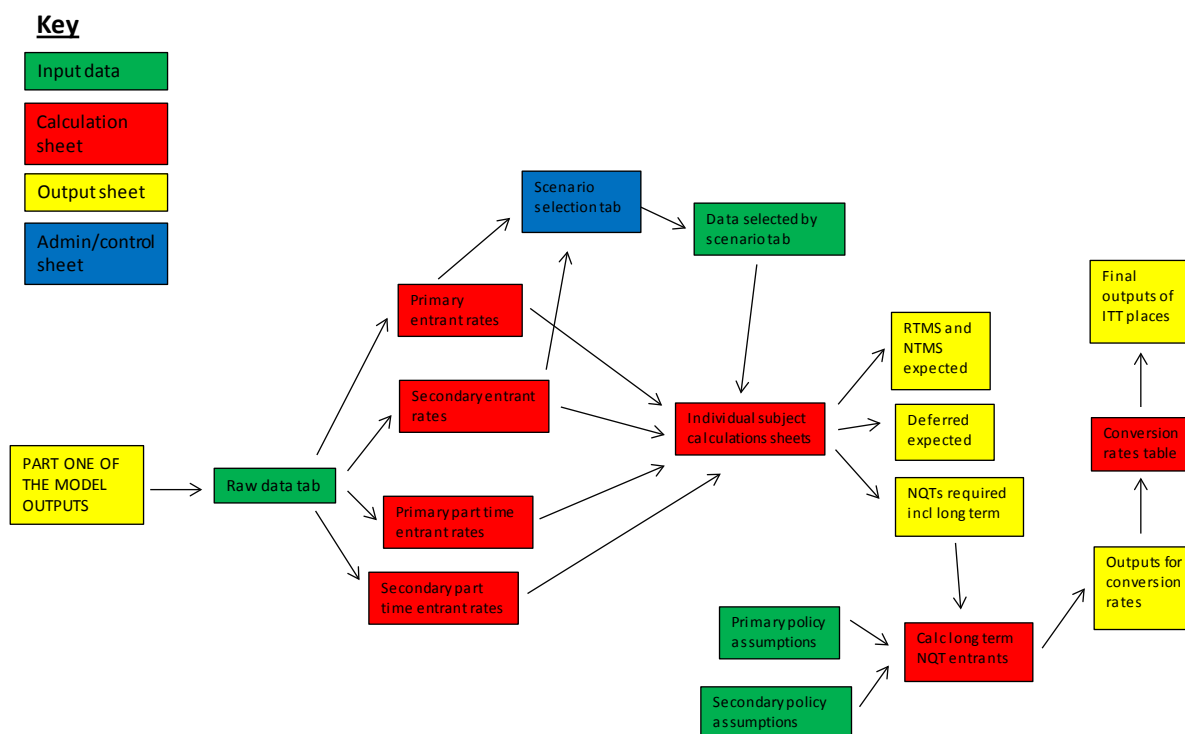
Each tab in the model workbook includes information at the top as to where data is sourced from and which tabs it may feed into.

Additionally, a model map is provided on the '**map of sheets**' tab showing which tabs feed into which and how the overall model is structured. This map is presented below as Figure 11.

Table 4 (see A.2 in the Annex) provides a description of each tab within Part Two of the 2015/16 TSM and what that tab does.

not teaching at all. Re-entrants are defined as teachers who are RTMS (Returners To Maintained Sector) and NTMS (New To Maintained Sector) combined together.

Figure 11: Map of Part Two of the Teacher Supply Model



4.3 The data that feeds into Part Two of the Teacher Supply Model

The following data sources feed into Part Two of the Teacher Supply Model:

- **Entrant teacher need** values (as a headcount) for all subjects and phases from Part One of the model.
 - The values for 2016/17 are the only ones used within Part Two of the 2015/16 TSM.
 - Values for high, central, and low scenarios are used (as estimated using scenario testing in Part One).
 - Only the central scenario values are used in the NCTL allocations model. The higher and lower values are only used as an indication of how much lower/higher the need for NQTs/trainees might be given extremes of what might happen (e.g. all the different scenarios conspire in the same direction to make the teacher need higher/lower).
- **Teacher entrants data** from the **Database of Teacher Records (DTR)**. See Section 3.7 for more details on the DTR.

- **Teacher stocks data** from the **School Workforce Census 2013**.
 - Data on the Full-time Equivalent (FTE) rates of part-time teachers.
- Data from the **National College for Teaching and Leadership** on:
 - The **number of trainees completing ITT** from the **NCTL Performance Profiles**. This data is a weighted average from the four most recent years of data.
 - The **number of trainees gaining employment** in the state-funded sector on completion of ITT from the **Destination of Leavers from Higher Education (DHLE) survey**. This data is a weighted average from the four most recent years of data.
 - Data on the number of trainees on longer term courses from the **NCTL Data Management System**.

All data inputs into Part Two of the model are provided in the '**raw data inputs**' tab in the model workbook.

The department's standards for data suppression require that fields relating to fewer than five individuals should not be published. In the department's statistical publication this is achieved by replacing figures based on fewer than 5 individuals with an "x". That approach does not work in the TSM as it would suppress the entire function within the model. To overcome this - and still apply the department's suppression rules - fields with fewer than 5 individuals have been aggregated either across gender or age bands. These amendments increases the overall ITT trainee need total by **one trainee**.

More information on the data sources used in the Teacher Supply Model can be found within **Section 7**.

4.4 How does the model estimate the numbers of entrants needed via NQT and non NQT (e.g. deferred entrants or re-entrants) routes?

Part Two of the TSM calculates the no. of NQT entrants required in a particular year using the following formula:

No. NQT entrants required in yr x (*NQT entrant need*) = 'Need' for entrant teachers in yr x (*entrant need*) -

No. deferred entrants expected in yr x (*deferred entrant need*) -

No. re-entrants expected in yr x (*re-entrant need*)

Therefore the model is assuming that the no. of NQT entrant teachers required in 2016/17 is equal to the overall entrant need for 2016/17 minus the no. that will enter via the other entrant routes in that year.

Values are estimated using the high, central, and low scenarios as determined by scenario testing in Part One of the model.

The proportion of the 'entrant need' that will be met by re-entrants or those who are deferred entrants is assumed using a weighted⁵⁹ average of re-entrant & deferred rates from the previous four years of data⁶⁰.

Values are calculated separately for the primary and secondary phases only as the DTR does not provide data for the individual subjects. Values are calculated for the primary phase on the '**calc PRIM entrant rates**' tab and on the '**calc SEC entrant rates**' for the secondary.

For example, if the weighted historical re-entrant rate is 40%, the model assumes that 40% of entrants will be re-entrants. If the entrant need for maths teachers in 2016/17 is 1,000, the model will assume that 400 (40%) of the maths entrants in 2016/17 will be re-entrants.

4.5 How does the model account for different working patterns among the entrants?

Not all entrants will be employed as teachers full-time, with a Full Time Equivalent (FTE) value of 1.0. In particular, NQTs are more likely to be employed full-time than entrants via other entrant routes such as re-entrants. As a consequence, one entrant teacher does not necessarily equal 1.0 FTE teacher.

To ensure that the number of entrants *will* provide the number of FTE teachers required (as identified by Part One⁶¹), Part Two of the model has to ensure that the FTE 'quantity of teachers' entering the stock via each route is equal to the FTE quantity needed from Part One.

Database of Teacher Records (DTR) data on entrants does not provide information on teachers' FTE rates, it only provides information on whether teachers are employed part-time or full-time. As a consequence, the TSM assumes that full-time entrants are 1.0 FTE and part-time entrants have an FTE value equal to the average FTE of part-time teachers⁶² as calculated within the current stock (from the SWFC).

The expected FTE rates of the entrants via the different routes are estimated by the model using historical weighted averages of DTR entrants data, e.g. 10% of returners are

⁵⁹ A weighted average is used to account for the fact that the two most recent years of data is provisional and subject to change.

⁶⁰ Data is from the Database of Teacher Records.

⁶¹ The entrant teacher need.

⁶² For the relevant phase.

part-time, 2% of NQTs are part-time etc. Values are estimated on the '**calc PRIM part-time entrants**' and '**calc SEC part-time entrants**' tabs for the two phases respectively.

Using these assumptions, the model then calculates the *actual* FTE value of teachers supplied by each route for each phase and subject on the relevant phase/subject tab. For example, all maths calculations are performed on the '**maths**' tab, the primary on the '**primary**' tab etc.

The model scales the numbers of entrants via each route accordingly to provide enough FTE teachers to meet the entrant teacher need whilst still retaining the rates of entrant teachers via the different routes as expected⁶³.

As DTR data does not provide subject specific information, the model assumes that the rates of deferred entrants and re-entrants expected are consistent across secondary subjects. The number of deferred entrants and re-entrants expected by phase and subject are collated on the '**Deferred expected**' and '**RTMS and NTMS expected**' tabs respectively.

The model assumes that any remaining entrants (other than deferred entrants and re-entrants) will be NQTs.

4.6 How does the model estimate the numbers of entrants via NQT routes who studied on courses lasting longer than a year?

The model has now calculated the number of entrants expected who are NQTs by both subject and phase (the NQT entrant teacher need for 2016/17). These values are collated on the '**NQT entrants required inc UGs**' tab.

However, some of these NQTs will be those who have studied on courses lasting more than one year⁶⁴. These trainees would *not* require recruitment to ITT beginning in 2015/16 as they are already 'in the ITT system'.

To reduce the 2016/17 NQT entrant teacher need accordingly to remove these trainees on longer courses, the model uses NCTL ITT census data to identify the no. of trainees on longer undergraduate/postgraduate courses by phase and subject who are expected to graduate in 2015/16.

Using subject/phase ITT specific drop-out rates and rates of employment on the completion of ITT, the model estimates (on the '**Calc long term NQT entrants**' tab) the

⁶³ As calculated and assumed from the historical DTR data on the proportion of entrants via different routes.

⁶⁴ Their courses would begin before 2015/16.

no. of these trainees who are expected to complete their ITT courses *and* enter into the active stock in 2016/17 (using historical performance profiles data from NCTL). These numbers are calculated for all phases and subjects.

This number of NQT entrants who studied on longer courses that will meet part of the 2016/17 NQT entrant teacher need are subtracted from the overall NQT entrant teacher need accordingly.

This provides the 2016/17 NQT entrant teacher need value by phase and subject for those NQTs who will both start and complete ITT in 2015/16 to enter the active stock in 2016/17.

4.7 How does the model convert the number of trainees into the number needed to start ITT?

The model uses subject/phase specific ITT drop-out rates and rates of employment on the completion of ITT to convert the 2016/17 NQT entrant teacher need into the number of trainees required to both begin and complete ITT in 2015/16 (the 2015/16 ITT trainee need). This ITT trainee need *includes* School Direct and Teach First trainees. These calculations take place on the '**conversion rates table**' tab.

When using the ITT drop-out rates and rates of employment, the model assumes that the distribution of places to different routes (e.g. HEI, School/employment based etc) will be the same as for the most recent years.

The final outputs of the TSM to feed into the allocations model are summarised on the '**Final outputs of ITT places**' tab.

4.8 How does the model calculate the number of trainees starting ITT in 2015/16 on longer courses?

The TSM does *not* calculate the number of trainees required who will start ITT courses of more than one year length in 2015/16.

Such trainees would not be able to meet part of the teacher need or join the active qualified teacher stock until *after* 2016/17.

If NCTL wished to allocate additional ITT places to longer ITT courses (e.g. places on primary undergraduate courses), these would simply be accounted for in future versions of the model as described in Section 4.6.

Section 5: Scenario testing in Part One of the model

Section 5 of this user guide describes:

- How to use scenario testing in Part One of the 2015/16 Teacher Supply Model, and
- How to examine the outputs derived from such scenario testing.

5.1 How to use scenario testing in Part One of the TSM

Part One of the TSM offers a range of scenario testing options on the 'SCENARIO SELECTION TAB' tab.

Figure 12: Screenshot of the scenario testing in Part One of the Teacher Supply Model

1. Econometric wastage scenarios - scalars

Users can select different projected wastage scenarios.

The central scenario is based on the Office for Budget Responsibility's GDP and unemployment forecasts. There are also high and low scenarios which are produced using figures taken from the extremes of HMT's comparison of independent forecasts.

Male

Female

2. Pupil projections - scenarios

Users can select different projected pupil population scenarios.

The central scenario is the scenario used in the Pupil Projections Model. The high and low scenarios are the highest and lowest scenarios for pupil no.s change given extremes of the maternity, immigration and participation rates under different ONS scenarios.

Note- logically all the pupil projections scenarios should be set to the same scenario, e.g. if primary age pupil projections are at the higher projected levels, so should the projection of secondary age pupils.

Primary age

KS3

KS4

KS5

3. Pupil Teacher Ratio caps - scenarios

Users can select the capped PTRs used by the model to calculate teacher need (the no. of teachers needed). The lowest cap values were used in the previous TSM.

The central caps are based on the highest PTRs observed around the start of the millennium.

The highest caps are based on the PTRs observed in the 1970s when pupil populations reached the maximum levels seen in the last 50 years.

The extreme caps are based on the PTRs observed in the 1950s when PTRs reached the maximum levels seen in the last 60 years (note- pupil no.s were actually lower than during the 1970s).

There is also the opportunity to use manually selected cap values by using the drop down menu and entering values (e.g. 21) in the grey boxes below.

The previous version of the TSM used caps of 19.82 for primary and 14.98 for secondary (it should be noted that the PTR cap used in the old model was re-calculated as PTRs changed through the use of updated population and stock data).

Although the secondary phase uses the central cap, the primary phase uses a constant cap thereby maintaining the PTR cap at current levels.

Primary

Secondary

Primary PTR cap manual values

 enter a value

Secondary PTR cap manual values

 enter a value

4. Pupil Teacher Ratio change rates - scenarios

Users can select different rates at which PTRs will change as pupil no.s change. The central scenarios were used in the old model. The higher the rate, the faster the PTR will change as pupil no.s change. For each 1% increase in the pupil population, the PTR will increase by the percentage rate selected.

The central rate is based on the PTR change rates observed during the longer term increases in PTR seen at the start of the millennium. The 2nd highest and 2nd lowest rates are based on the most rapid changes in PTR around the start of the millennium. Alternative scenarios of slightly higher/lower rates are also supplied for comparison.

There is also the opportunity to use manually selected PTR change rate values by using the drop down menu and entering values (e.g. 0.4) in the grey boxes below.

Primary

Secondary

Primary PTR change rate

 enter a value

Secondary PTR change rate

 enter a value

Users of the model can select *different* scenarios of data to be used in Part One of the model using the drop down menus provided. See Figure 12 for an illustration of the scenario testing tab.

Figure 13: Screenshot of the scenario testing outputs in Part One of the Teacher Supply Model

Teacher 'entrant need' output values generated by the model using the scenarios as selected.

These are the model outputs generated using the scenarios selected using the drop down menus above.

	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Primary	29445	29691	30206	29227	28414	27247	28048	27576	26956	26581	27178	26803
Art & Design	886	951	965	1004	1030	1046	1023	1031	1036	1054	1021	1033
Biology	1147	1211	1468	1345	1408	1409	1390	1419	1450	1420	1378	1430
Business	424	407	397	428	437	423	447	483	521	509	514	546
Chemistry	958	1000	1228	1120	1178	1174	1162	1190	1220	1182	1146	1198
Classics	41	39	36	35	34	33	32	33	33	34	34	34
Computing	846	894	902	960	1001	1009	991	1006	1021	1013	980	1009
D and T	1581	1692	1700	1748	1786	1801	1721	1698	1674	1682	1602	1610
Drama	496	545	557	579	595	610	594	596	596	614	595	600
English	3032	3048	3103	3319	3471	3495	3390	3406	3422	3366	3230	3323
Geography	942	981	993	1030	1061	1082	1046	1046	1043	1064	1024	1035
History	1015	1047	1058	1101	1135	1155	1125	1131	1135	1154	1115	1131
Maths	3250	3308	3380	3652	3594	3638	3571	3535	3478	3435	3304	3385
MFL	1628	1732	1776	1853	1914	1953	1879	1864	1844	1870	1789	1797
Music	500	562	576	586	597	619	595	588	579	610	587	581
Others	1740	1739	1701	1729	1716	1697	1731	1805	1882	1925	1922	1971
PE	1488	1619	1658	1798	1906	1937	1887	1911	1934	1915	1844	1910
Physics	928	963	1184	1077	1137	1133	1115	1139	1164	1121	1082	1132
RE	732	785	795	839	870	877	850	852	854	848	815	833
Total secondary entrant need	21635	22522	23477	24203	24871	25091	24550	24732	24888	24816	23983	24557

Differences between the values calculated above and those calculated using central scenario values only.

	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
Primary	0	0	0	0	0	0	0	0	0	0	0	0
Art & Design	0	0	0	0	0	0	0	0	0	0	0	0
Biology	0	0	0	0	0	0	0	0	0	0	0	0
Business	0	0	0	0	0	0	0	0	0	0	0	0
Chemistry	0	0	0	0	0	0	0	0	0	0	0	0
Classics	0	0	0	0	0	0	0	0	0	0	0	0
Computing	0	0	0	0	0	0	0	0	0	0	0	0
D and T	0	0	0	0	0	0	0	0	0	0	0	0
Drama	0	0	0	0	0	0	0	0	0	0	0	0
English	0	0	0	0	0	0	0	0	0	0	0	0
Geography	0	0	0	0	0	0	0	0	0	0	0	0
History	0	0	0	0	0	0	0	0	0	0	0	0
Maths	0	0	0	0	0	0	0	0	0	0	0	0
MFL	0	0	0	0	0	0	0	0	0	0	0	0
Music	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	0	0	0	0	0	0	0	0	0	0	0
PE	0	0	0	0	0	0	0	0	0	0	0	0
Physics	0	0	0	0	0	0	0	0	0	0	0	0
RE	0	0	0	0	0	0	0	0	0	0	0	0
Total secondary entrant need	0	0	0	0	0	0	0	0	0	0	0	0

There are a number of scenarios available for testing with further information provided under the relevant headings as to where the scenarios are derived from. The scenario tests available include testing:

- Projected future teacher wastage (high, central, and low scenarios) for both genders.

- Projected pupil populations (high, central, and low scenarios) as derived within the Pupil Projections Model.
- Different scenarios on how rapidly the PTR will change with changing pupil numbers and how high the PTR cap is as used by the model.

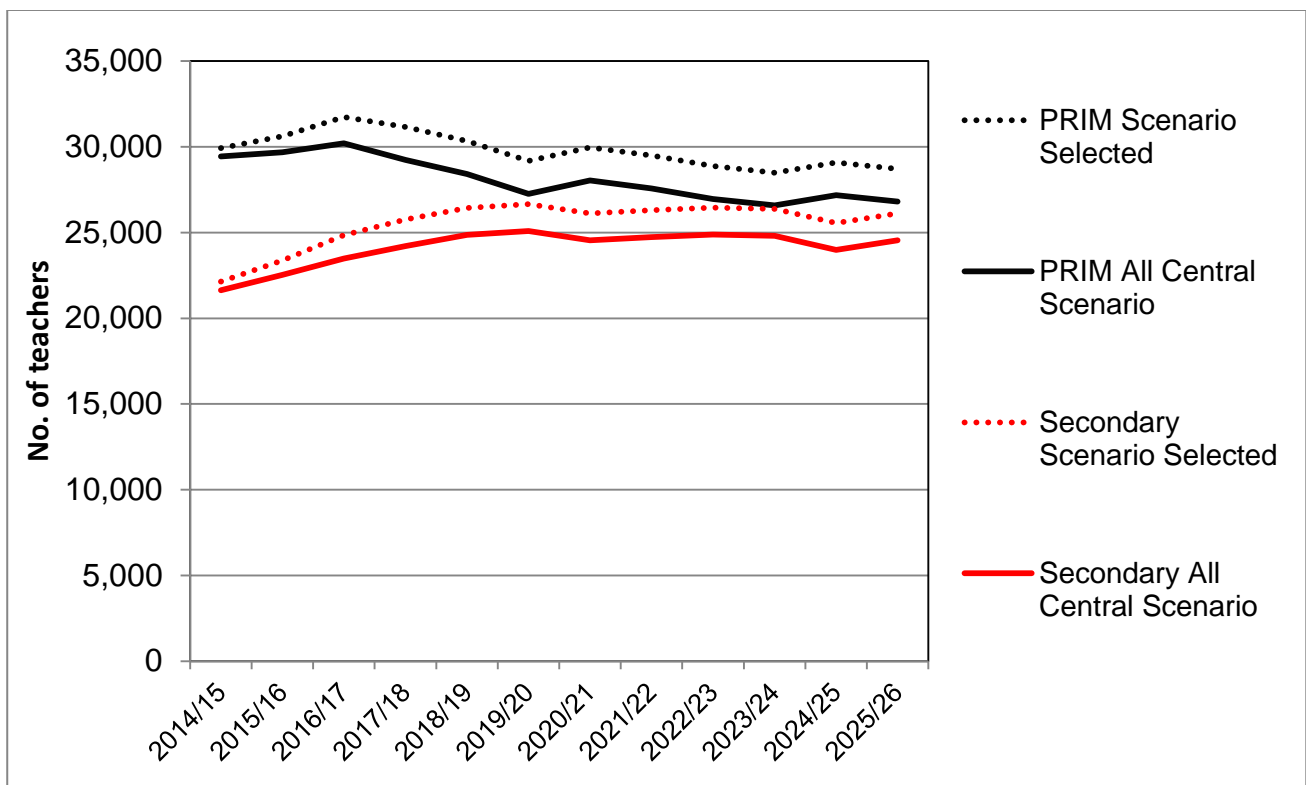
Further details are provided on the scenario testing tab.

Users can then examine how the model outputs of teacher entrant need change within the highlighted tables provided below the drop down menus on the scenario testing tab. Figure 13 above shows a screenshot of the relevant tables.

Additionally, users can examine both the impact of changes to the teacher need *and* the entrant teacher need values using the charts provided on the ‘**entrant need charts over time**’ and ‘**teacher need charts over time**’ tabs. Comparisons are made to the default (central scenario) settings for easy examination of the impact of the scenario changes used.

Figure 14 below provides an example of the impact of scenario testing on the primary and secondary entrant teacher need using high wastage scenarios for both male and female teachers.

Figure 14: Entrant teacher need values by phase as calculated by the 2015/16 Teacher Supply Model using high wastage scenarios for both genders (Scenario Selected) and the default/central scenario (All Central Scenario values)



By experimenting with the scenario testing in Part One, high, low, and central values of entrant teacher need can be calculated by phase and subject and are used to feed into Part Two.

Section 6: Scenario testing in Part Two of the model

Section 6 of this user guide describes:

- How to use Scenario testing in Part Two of the 2015/16 Teacher Supply Model, and
- How to examine the outputs derived from such scenario testing.

6.1 How to use scenario testing in Part Two of the TSM

Part Two of the model offers scenario testing on the proportion of entrants who will be re-entrants on the '**SCENARIO SELECTION TAB**' tab.

Users of the model can select *different* scenarios of data to be used in Part Two of the model using the drop down menus provided.

Users of the model can select different re-entrant rates scenarios to be used in the model using the drop down menus. Users can then examine how the model outputs of ITT trainee need change when using the new values by examining the yellow tables beneath the drop down menus.

Additionally, users can examine how the values compare to the ITT trainee need values derived using the central or default selections.

See Figure 15 for an illustration of the scenario testing available in Part Two.

Figure 15: Screenshot of the scenario testing in Part Two of the Teacher Supply Model

1. RTMS & NTMS entrant rates (re-entrant rates) - scenarios

Users can select different rates of the proportion of entrants who will be RTMS or NTMS (re-entrants).

The **central scenario rate** is based on weighted averages of historical rates from the most recent four years for which we have data. (As data is provisional for the two most recent years, the data is weighted).

There are four additional scenarios of alternative re-entrant rates for both phases. These rates are **5 and 10% higher/lower** than the central rate.

Primary

Secondary

Central rate (historical rate) ▼

Central rate (historical rate) ▼

The 'ITT trainee need' output values generated by the model using the scenarios as selected.

These are the model outputs generated using the scenarios selected using the drop down menus above.

	Lowest	Central	Highest
Art & Design	674	794	862
Biology	1,018	1,178	1,274
Business studies	256	313	347
Chemistry	912	1,053	1,140
Classics	60	69	74
Computing	608	723	796
Design and technology	1,103	1,279	1,387
Drama	366	435	474
English	1,898	2,253	2,455
Geography	662	778	848
History	695	815	889
Maths	2,220	2,581	2,805
MFL	1,289	1,514	1,641
Music	409	481	525
Other	1,127	1,340	1,467
PE	1,011	1,227	1,362
Physics	919	1,055	1,139
Primary	8,857	11,245	12,542
RE	552	650	708

Differences between the values calculated above and those calculated using central rate scenario values only.

	Lowest	Central	Highest
Art & Design	0	0	0
Biology	0	0	0
Business studies	0	0	0
Chemistry	0	0	0
Classics	0	0	0
Computing	0	0	0
Design and technology	0	0	0
Drama	0	0	0
English	0	0	0
Geography	0	0	0
History	0	0	0
Maths	0	0	0
MFL	0	0	0
Music	0	0	0
Other	0	0	0
PE	0	0	0
Physics	0	0	0
Primary	0	0	0
RE	0	0	0

Section 7: Additional information on the data sources of the TSM

1. The **NCTL Employment Dataset** provides the number of ITT trainees who are expected to enter teaching after a one or two year break.
<http://dataprotection.education.gov.uk/public/page.htm?to-page=publicProfilesHome>
2. The **DLHE survey** provides the outcomes of Higher Education trainees and can be found on <https://www.hesa.ac.uk>
3. The **ITT Data Management System** provides the course lengths and numbers of new ITT trainees by route.
4. The **Database of Teacher Records** is derived from teacher pensions data and provides the numbers of active teachers, the number of inactive teachers and the rate of flow between these two groups.
5. The **School Workforce Census** provides information about the number of hours teachers spend teaching each subject and is a secondary source for teacher flows.
<https://www.gov.uk/government/collections/statistics-school-workforce>
6. **National Pupil Projections** are used in the demand modelling.
<https://www.gov.uk/government/collections/statistics-pupil-projections>
7. **PENSTATS** is an unpublished teacher pension data source held by the Department for Education which is used to model retirements.
8. **ONS National unemployment statistics** are used in the teacher wastage model.
<http://www.ons.gov.uk/ons/rel/lms/labour-market-statistics/november-2013/statistical-bulletin.html>
9. **Office for Budgetary Responsibility estimates of Gross Domestic Product** are also used in the teacher wastage model.
<http://cdn.budgetresponsibility.independent.gov.uk/March-2013-EFO-44734674673453.pdf>

Annex:

A.1 Further information on the structure of Part One of the Teacher Supply Model

Table 3 below illustrates the purpose of each tab within Part One of the 2015/16 TSM.

Table 3: The tabs within Part One of the 2015/16 Teacher Supply Model

Name of tab	Description
Title & Contents	Contents of Part One of the Teacher Supply Model and the purpose of each tab.
Details	Brief summary of model and how it feeds into Part Two (along with details of current version and colour key).
Maps of Sheets	Colour-coded map of the sheets in the spreadsheet.
Subject groupings defined	Defines the phases and subjects as used and modelled in the TSM.
Scenario selection	Tab enabling users to select scenarios to be used in the model calculations and examine the outputs of the scenario testing.
Raw data inputs	Takes the raw data inputs into the model from all input sources.
Policy assumptions Primary	Lists the policy assumptions at primary level to play into the teacher need calculations.
Policy assumptions Secondary	Lists the policy assumptions at secondary level to play into the teacher need calculations.
DATA SELECTED BY SELECTION TAB	Lists the data as selected by the scenarios tab to play into the wider model.
Calc PRIM retirement rates	Calculates retirement rates at primary level.
Calc SEC retirement rates	Calculates retirement rates at secondary level. They are the same for all subjects.
Calc PRIM death and barred rates	Calculates death and barred teacher rates at primary level.
Calc SEC death and barred rates	Calculates death and barred teacher rates at secondary level. They are the same for all subjects.
Calc PRIM wastage rates	Calculates wastage rates at primary level.
Calc SEC wastage rates	Calculates wastage rates at secondary level. They are the same for all subjects.
Projected PRIM wastage rates	Calculates projected wastage rates at primary level.
Projected SEC wastage rates	Calculates projected wastage rates at secondary level. They are the same for all subjects.
Stock calculations	Calculates the Full Time Equivalent (FTE) and unqualified teacher rates for the stock.
Stock ages breakdowns	Calculates the age group breakdowns of the stocks.
Calculation primary teacher need	Calculates the primary teacher need.
Calculation overall secondary teacher need	Calculates the overall secondary teacher need.
Teacher need by subject	Calculates the secondary teacher need for specific subjects.
Forecast stock figures	Forecasts how the size of the stock will change over time.
Entrant age breakdowns	Calculates the age group breakdown of entrants.
Pupil data scenarios	Summarises the pupil projection figures using different population scenarios. Also, calculates KS5 pupil projections.
Primary	Calculates the entrant teacher need for primary teachers and assumptions made on the number of leavers for the phase and how the stock changes over time (including size and characteristics).
Art & Design	Calculates the entrant teacher need for art and design teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and characteristics).
Biology	Calculates the entrant teacher need for biology teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and

Name of tab	Description
	characteristics).
Business studies	Calculates the entrant teacher need for business studies teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and characteristics).
Chemistry	Calculates the entrant teacher need for chemistry teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and characteristics).
Classics	Calculates the entrant teacher need for classics teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and characteristics).
Computing	Calculates the entrant teacher need for computing teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and characteristics).
Design and Technology	Calculates the entrant teacher need for design and technology teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and characteristics).
Drama	Calculates the entrant teacher need for drama teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and characteristics).
English	Calculates the entrant teacher need for English teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and characteristics).
Geography	Calculates the entrant teacher need for geography teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and characteristics).
History	Calculates the entrant teacher need for history teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and characteristics).
Maths	Calculates the entrant teacher need for maths teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and characteristics).
MFL	Calculates the entrant teacher need for MFL teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and characteristics).
Music	Calculates the entrant teacher need for music teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and characteristics).
Others	Calculates the entrant teacher need for other subject teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and characteristics).
PE	Calculates the entrant teacher need for PE teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and characteristics).
Physics	Calculates the entrant teacher need for physics teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and

Name of tab	Description
	characteristics).
RE	Calculates the entrant teacher need for RE teachers and assumptions made on the number of leavers for the subject and how the stock changes over time (including size and characteristics).
Deaths and barred over time	Summarises the no. of teachers assumed will leave as deaths in service or barred from service over time for all subjects.
No.s of wastage over time	Summarises the no. of teachers assumed will leave as wastage over time for all subjects.
No.s of retirement over time	Summarises the no. of teachers assumed will leave as retirements over time for all subjects.
No.s of leavers over time	Summarises the no. of teachers assumed will leave from service by all routes over time for all subjects.
Entrant need charts over time	Charts summarising entrant teacher need over time for all subjects.
Teacher need charts over time	Charts summarising teacher need over time for all subjects.
Pupil Projections scenarios	Charts summarising the pupil projections data used by the model.
Assumptions data	Summarises the assumptions data used by the model for calculations.
OUTPUTS FOR PART TWO	Summarises the entrant teacher need values calculated by the model to feed into Part Two of the model.

A.2 Further information on the structure of Part Two of the Teacher Supply Model

Table 4 below illustrates the purpose of each tab within Part Two of the 2015/16 TSM.

Table 4: The tabs within Part Two of the 2015/16 Teacher Supply Model

Name of tab	Description
Title & Contents	Contents of Part One of the Teacher Supply Model and the purpose of each tab.
Details	Brief summary of model and how it feeds into further models (along with details of current version and colour key).
Map of Sheets	Colour-coded map of the sheets in the spreadsheet.
Subject groupings defined	Defines the phases and subjects as modelled in the TSM.
Scenario selection	Tab enabling users to select scenarios to be used in the model calculations.
Raw data inputs	Takes the raw data inputs into the model from all input sources.
Assumptions data	Summarises the assumptions data used in the model.
DATA SELECTED BY SELECTION TAB	Lists the data as selected by the scenarios tab to play into the wider model.
Policy assumptions Primary	Lists the primary policy assumptions as used by the model.
Policy assumptions Secondary	Lists the secondary policy assumptions as used by the model.
Calc PRIM entrant rates	Calculates the proportion of primary teachers historically entering the stock via different entrant routes.
Calc SEC entrant rates	Calculates the proportion of secondary teachers historically entering the stock via different entrant routes.
Calc PRIM part time entrants	Calculates the proportion of historical primary teacher entrants who are part time via the different routes.
Calc SEC part time entrants	Calculates the proportion of historical secondary teacher entrants who are part time via the different routes.
Primary	Calculates the proportion of primary teachers expected to enter by different entrant routes.
Art & Design	Calculates the proportion of art and design teachers expected to enter by different entrant routes.
Biology	Calculates the proportion of biology teachers expected to enter by different entrant routes.
Business studies	Calculates the proportion of business studies teachers expected to enter by different entrant routes.

Name of tab	Description
Chemistry	Calculates the proportion of chemistry teachers expected to enter by different entrant routes.
Classics	Calculates the proportion of classics teachers expected to enter by different entrant routes.
Computing	Calculates the proportion of computing teachers expected to enter by different entrant routes.
Design and Technology	Calculates the proportion of D and T teachers expected to enter by different entrant routes.
Drama	Calculates the proportion of drama teachers expected to enter by different entrant routes.
English	Calculates the proportion of English teachers expected to enter by different entrant routes.
Geography	Calculates the proportion of geography teachers expected to enter by different entrant routes.
History	Calculates the proportion of history teachers expected to enter by different entrant routes.
Maths	Calculates the proportion of maths teachers expected to enter by different entrant routes.
MFL	Calculates the proportion of MFL teachers expected to enter by different entrant routes.
Music	Calculates the proportion of music teachers expected to enter by different entrant routes.
Others	Calculates the proportion of others teachers expected to enter by different entrant routes.
PE	Calculates the proportion of PE teachers expected to enter by different entrant routes.
Physics	Calculates the proportion of physics teachers expected to enter by different entrant routes.
RE	Calculates the proportion of RE teachers expected to enter by different entrant routes.
Calc long term NQT entrants	Calculates the proportion of the NQT entrants needed that will be NQTs in 2016/17 who studied on longer term ITT courses that began before 2015/16.
RTMS and NTMS expected	Summarises the no. of teachers expected to enter as RTMS or NTMS for all subjects.
Deferred expected	Summarises the no. of teachers expected to enter as deferred entrants for all subjects.
NQT entrants required inc Ugs	Summarises the no. of teachers expected to enter as NQTs for all subjects including those on longer courses.
Outputs for conversion rates	Summarises the outputs to feed into the conversion rates table tab.
Conversion rates table	Converts the NQT entrant teacher need into the ITT trainee need using estimations of how many trainees are expected to complete ITT and how many are expected to go into employment within 6 months of ITT completion.
Final outputs of ITT places	Summarises outputs to feed into the NCTL allocations model.



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