Teaching for Tomorrow (TfT) Handbook
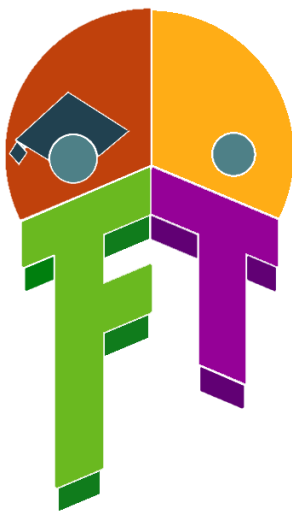
21st Century Learning in Action

Teaching for Tomorrow

21st Century Learning in Action

Contents

Introduction

1. **Teaching for Tomorrow (TfT)**

2. **Rationale**

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The Teaching for Tomorrow Approach

"The role of the teacher is to create the conditions for invention, rather than provide ready-made knowledge"

- Seymour Papert (1993)

Teamwork

Technology-mediated

Inquiry-based Learning

Classroom Partnership

Each of these components is common and reasonably well understood as being essential for 21st Century Learning. However, their combination and systematic application, particularly in formal education, is unusual. TfT offers a structured approach for the creation and delivery of activities that embody these fundamental elements.

Rationale

▶Classroom Partnership

The Teaching for Tomorrow (TfT) pedagogic model looks quite different to the traditional classroom.

▶ Teachers act as **facilitators** or mentors, and often as co-learners.

▶ The physical **space** is arranged to support the collaborative nature of the learning. Furniture that can be arranged in a variety of different configurations is ideal.

▶ **Reflection** is encouraged at various points throughout activities.

▶Teamwork

The TfT model of teamwork involves mixed ability students working together to achieve a goal. This model

▶ Encourages young people to become *confident learners*.

▶ Improves *problem solving* skills.

▶ Raises *personal educational horizons*.

▶ Encourages *peer learning*.

Rationale

▶ Inquiry-based Learning (IBL)

IBL begins with a question or problem, rather than presentation of established facts and rules. It is characterised by active participation of students, and promotes creative engagement with processes such as:

- ▶ **identifying** the problem or area of inquiry,
- ▶ **critiquing** approaches, and distinguishing alternatives,
- ▶ **planning** investigations,
- ▶ searching for information, **researching**, and **justifying** conjectures, and
- ▶ **presenting** coherent arguments.

▶ Technology-mediated Environment

Technology can be low-tech (white-boards, post-its etc.) or high-tech. However, in all cases:

- ▶ Students learn with, rather than about technology.
- ▶ The technology is meaningful and relevant to the particular problem.
- ▶ Technology is shared to encourage collaboration.

Impact: Why try the TfT Approach?

There are many ways in which students and educators can benefit from the TfT approach.

Educators will:

- ☑ Cultivate a student-centred culture of creativity and inquiry.
- ☑ Become connected to students at a more equal level.
- ☑ Share in their students' process of discovery and inquiry.
- ☑ Learn!

Students will:

- ☑ Be empowered to take ownership of their learning.
- ☑ Develop the skills of a lifelong learner.
- ☑ Enhance their skills of communication, collaboration, creativity and critical thinking.
- ☑ Develop and improve their presentation skills.
- ☑ Develop a more trusting relationship with their teachers and adults in general.
- ☑ Become more motivated and engaged in learning.
- ☑ Recognise meaningful connections between what they learn in the classroom and their experiences outside school.

> *"They're happier, they're more active, they're working harder – they like it more"* – Teacher

> *"An English project given to them recently... they just did it all themselves. They were able to work on their own and seem very self-motivated"* – Teacher

> *"Learning can be fun instead of boring. In the Bridge 21 you have a choice – either sit back and don't speak up or, and you won't have any fun, or speak up and learn new stuff and enjoy it."* – Student

Teachers' Guide

1. How do I begin? – Start Small!
2. Full-on TfT.
    1. Activity model
    2. Content and concepts
    3. Reflection
3. Sample Lesson Plans

Start Small!

1. Learning space

Room layout can have a profound effect on teaching and learning. Changing your learning space is an opportunity – change your own space, barter with other teachers or seek out rooms that allow for a group classroom layout in school. (link to horseshoe, watering hole and cave layouts).

2. Short Sample Activities

What follows are some short samples of exercises that will provide an opportunity to try out teamwork, IBL, and technology.

a. **Teamwork** is a fundamental aspect of 21st Century education. Before experimenting with teamwork, find a task that benefits from the students being in teams. here is one suggestion that should take about 10 minutes:

> ### Example a
>
> *Someone has written a sentence containing only five words, the average (or mean) number of letters in each word is 4, but none of the words has four letters. Work together to come up with suggestions for what the sentence might have been?*

See what makes this a good activity here

Start Small

b. **Technology – low-tech is ok!** Why not start by using low-tech resources, and slowly introduce digital technology, while still make the learning more active and engaging.

> ### *Example b*
>
> *Each team is allocated a different character from a play, novel, or short story. They write a blog post which captures the key points of that character and share it (digitally or otherwise) with the rest of the class.*

> ### *Example c*
>
> *Or, let the groups of students use post-it notes to create a time-line of a the first world war on the classroom wall.*

c. **Inquiry-based learning.** A collaborative, technology-mediated, active environment, forms the basis of the Teaching for Tomorrow approach. IBL can be used to extend *example c*, above.

> ### *Example d*
>
> *In order to extend this activity, encourage each group to select the names of three soldiers who died in the war (these can be found on plaques, through family records, or other sources) and research their stories using primary and secondary resources available online (history resources here). Then add their personal details to the timeline.*

… other sample activities can be found here.

3. What then? Reflection

Ask the students to discuss, use reflection sheets, think about it yourself… What worked and what didn't and why?

Full on TfT!
The Bridge21 Activity Model

An outline of the components found in a full Bridge21 activity are provided below. This should be adapted to your particular activity. The motivation for each step is available <u>here</u>.

Set-Up

Warm Up

Investigate

Planning

Create

Present

Reflect
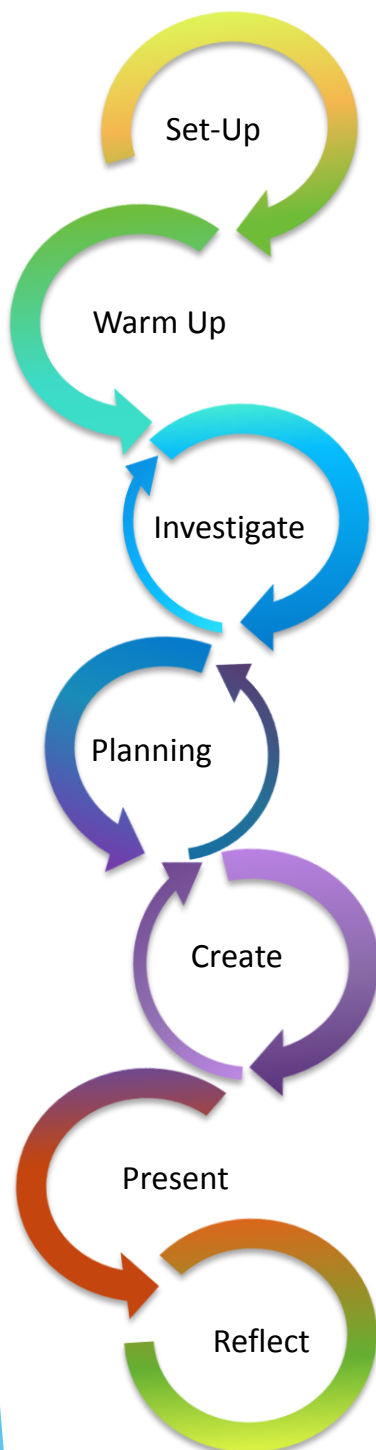
1. **Set up -** Useful to get students ready for active learning.

    a. <u>Ice-breaker</u> activities

    b. <u>Team-formation</u> activities

2. **Warm up** - Encourages team bonding and divergent thinking.

    a. <u>Warm up activities</u>

3. **Investigate -** facilitators loosely define the problem area encouraging teams to:

    a. <u>Inquire and research.</u>

    b. <u>Brainstorm and refine the problem.</u>

4. **Plan**:

    a. <u>Develop a task list.</u>

    b. <u>Identify team roles, schedule and resources.</u>

5. Create - The main part of the activity

    a. <u>Execute/Create</u>

    b. <u>Review/Evaluate/Test</u>

    c. <u>Reflect.</u>

6. Team Presentation/Competition: Provides focus and a deadline

7. Reflection

    a. <u>Individual and team reflection</u> [12]

    b. <u>Whole group discussion</u>

Full on TfT!

Content and Concepts

Students are capable of achieving more than is generally expected of them, particularly when they are in an environment in which they are encouraged to experiment, think critically, and be creative.

The TfT model encourages the delivery of *subject content* through student-led projects and inquiry. This involves the students in a process of research, analysis and synthesis. They are encouraged to take responsibility for uncovering the knowledge they require in order to develop a suitable solution or artefact, in a well-scaffolded environment.

The cross-curricular nature of TfT activities encourages the development of *conceptual understanding* of the topic under investigation by placing in a context that has meaning for the participants.

Full on TfT!

Reflection

Reflection has a variety of purposes. It can be used to improve future activities, in terms of design, organisation and student engagement. It can also be used as a tool for assessment.

*Reflection on the **process***:
- Observe and document the TfT activity: monitor change over time by taking notes and photos, and discussing the students' experiences with them.
- Use individual and group reflection sheets to gather more information about the students' experiences.
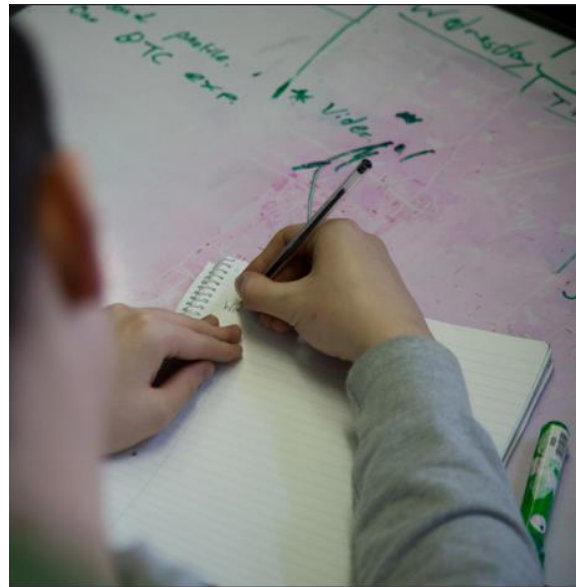
*Reflection on the **learning***:
- Engaging in Socratic questioning with students is a powerful tool to encourage them to reflect on their learning.
- The end of activity presentation provides another opportunity to get the students to reflect on what they have learnt, and on the work of the other teams.
- Whole-group plenary sessions also provide scope for probing the depth of understanding achieved by the students.

Activity Design Template

Topic/Theme: _____

Class/Year Group: _____

Subject(s): _____

Outline

What is the **challenge** your students will tackle?	Why is this **meaningful** to the students - what's the hook?	What are the **key ideas** that the students will remember?

Learning Objectives

What **curriculum content** will be addressed?

By the end of this activity students *will be able to:*

How are four key **21st Century Skills** addressed?

Creativity

Communication

Collaboration

Critical Thinking

Reflection

How will you know that they are learning?	In what ways will students reflect on progress?

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Activity Design Template

Possible Aspects	Description	Time
Set-Up		
Warm Up		
Investigate		
Planning		
Create		
Present		
Reflect		

Sample Lesson Plan – Dolly Diving

Topic/Theme: ___Dolly Diving___

Class/Year Group: ___Transition Year (Year 10)___

Subject(s): ___Mathematics___

Outline

What is the challenge your students will tackle?

Using a doll, rubber bands, and some free software, calculate how many bands it would take to give the doll an exhilarating, but safe jump from a height?

Why is this meaningful to the students – what's the hook?

Students love to throw things out of windows! It is active and fun.

What are the key ideas that the students will remember?

Links between mathematical representations. Difference between correlation and causality. What a function *is*! Extrapolation.

Learning Objectives

What curriculum content will be addressed?

Linear functions, Collection, representation and analysis of data, correlation, line of best fit, extrapolation.

By the end of the activity students will be able to:

Understand that functions represent a relationship between variables; gather data and represent them in different ways; use those data to extrapolate (make predictions); understand correlation and causality…

How are the 4 key 21st Century Skills addressed?

- *Creativity*: Students are required to think about the problem, and come up with a creative solution.
- *Communication*: Students need to clearly communicate their rationale for the steps they have taken
- *Collaboration*: Students work in teams to solve the problem.
- *Critical Thinking*: Students need to evaluate the approaches as well as their results, before the competition.

Reflection
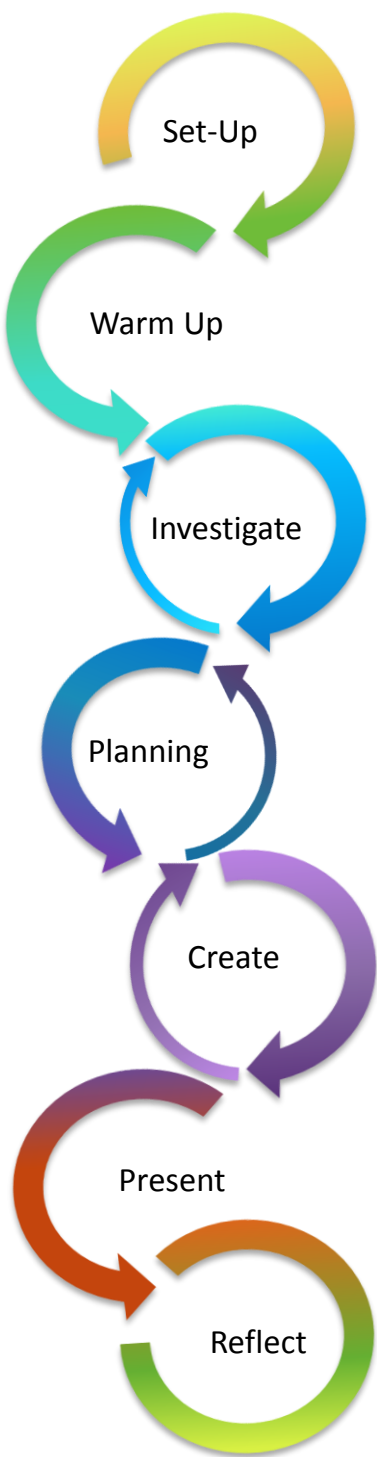
How will you know what they are learning?

This activity has a good roadmap. The facilitator will be able to ensure the students are on track through regular team lead meetings, as well as observation. Questions in plenary will be used to reflect on learning.

In what ways will students reflect on progress?

Students will reflect through interactions with the facilitators, as well as peer-to-peer interactions within and outside their groups. The final plenary session will allow them to reflect fully on the content of the activity.

Sample Lesson Plan – Dolly Diving

Possible Aspects	Description	Time
Set-Up	**Warm up** (skip set-up and team formation if in teams): How many €2 coins would it take to fill this room? With 2 min discussion answers and approaches.	10 mins
Warm Up	**Investigate**: present the problem and ask the teams to brainstorm approaches.	5 mins
Investigate	**Planning**: Plenary discussion about possible approaches and their merits. Discuss available technology. Allow the teams time to plan and divide tasks.	10/15 mins
Planning	**Create**: Iterative phase in which the teams gather data using Kinovea, and then find ways to represent the data using a spreadsheet. The mathematics will emerge throughout this process. The spreadsheet will enable the generation of a function to represent the relationship between bands and distance.	1 - 1.5 hours
Create	**Create**: teams will need to calculate the distance the doll is to drop, using the clinometer App in MobiMaths.	10 mins
Present	**Present**: A competition in which the teams drop the dolls from the height, to see whose calculations are most accurate.	10 mins
Reflect	**Reflect**: All groups reflect on their calculations. In a final plenary, groups discuss their approaches. The facilitator leads a discussion around the mathematics.	30 mins

Sample Lesson Plan – Radio Show

Topic/Theme: _____ Radio Show Project _____

Class/Year Group: _____ Year 8 – Year 12 (ages 14 - 18) _____

Subject(s): _____ Media Studies, Languages or Subject Specific _____

Outline

What is the challenge your students will tackle?	*Why is this meaningful to the students – what's the hook?*	*What are the key ideas that the students will remember?*
Student groups will produce a 5 minute radio show.	Students are generally familiar with podcasts and radio shows. Here they get to create one about something that interests them.	Student will develop a sense of what it is like to produce work under pressure. They will develop a sense of time management

Learning Objectives

What curriculum content will be addressed?

Depending on subject choice but in general terms scripting and creative writing.

By the end of the activity students will be able to:

- Use Audacity or similar sound recording software to record, edit, mix and produce a short radio show.
- Plan and script segments of show based on
- ideas, information found online and public interviews.

How are the 4 key 21st Century Skills addressed?

- *Creativity*: Brainstorming to scope, plan and script a radio show.
- *Communication*: Interview skills for conducting voxpop with the public.
- *Collaboration*: While each student is responsible for a different segment of the show, they must be consistent.
- *Critical Thinking*: Finding solutions to sound editing issues; evaluating information sources

Reflection

How will you know what they are learning?

Through observation of student activity and engagement, and by analysis of their finished radio show products.

In what ways will students reflect on progress?

Students will give an oral Presentation to group before playing their radio show. This gives the students an opportunity to reflect on their progress.

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Sample Lesson Plan – Dolly Diving

Possible Aspects	Description	Time
Set-Up	**Set-up:** Introduction to the day and team formation.	10 -15 mins
Warm Up	**Warm up**: Teams Brainstorm ways to communicate on whiteboard; then each team lists three pros and cons for two methods of communication	25 mins
Investigate	**Warm up**: Teams use whiteboards to brainstorm recent news stories, or stories of the year. Each team choses a story, investigates it using primary and secondary online sources, and presents the story to whole group, using one photo but no slides.	40 mins
Planning	**Investigate**: Introduce and explain the main task. Using the Radio Show project template (in student resources) teams brainstorm ideas for a radio show.	10 mins
Create	**Plan**: Teams come up with a plan and assign roles.	10 mins
Present	**Create**: Teams working on task, as described in the project template.	2 – 2.5 hours
Reflect	**Present**: Each team presents an oral reflection on the process (3 mins), as well as their radio show (5 mins).	~ 1 hour, depending on the number of teams.
	Reflect: General, whole group reflection, focusing on what was learned and where the challenges lay.	30 mins

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Student Resources

1. **Student companion worksheets**

2. **Reflection resources**

Student Companion Worksheet – Dolly Diving

Software

Kinovea
- Import your videos onto the laptop.
- Launch Kinovea and open the first video.
- Use the line tool to indicate a distance you know the length of. Right click on the line and calibrate measure to known distance.
- Use the line tool to measure the maximum vertical distance of each jump.

Excel
- Open a spreadsheet and create a table with columns relating to the number of bands and the distance jumped.
- Discuss the best type of graph to represent the data collected.
- Insert an appropriate graph, making sure that the axes are correctly labelled.
- Can you use the spreadsheet to display a "line of best fit"?
- Can you generate/display the equation of this line?
- Using the data you have gathered, how many rubber bands would it take to give the doll an exhilarating, but safe jump from a first floor window?
- Test your hypothesis!

Student Companion Worksheet – Radio Show

Your Main task for today is to research, record and produce a **5 minute** radio show aimed at other Transition Year Students. You will be using microphones, a handheld recording device and sound files found on the internet.

Your show **MUST HAVE:**

- A one minute report on any topic/current affair (check with other teams) in which you cite a primary source and any others.

- A jingle for your show (Joeeeeeeee Dufffffy.. etc..).

- A short weather report for the next two days.

- A public Vox-Pop (Ask the public a question).

- A review of a book, movie, tvshow (no spoilers though!).

- A creative use of music (see below).

- An M.C that links the parts of the show together "and here's Mike with the news etc.."

Your show **MUST NOT HAVE:**

- Any music clips over 10seconds long. If you can think of creative ways to add in short music clips like "guess that sound" or "top ten metal songs in one minute" then that's acceptable..but no full songs (We mean it!!!).

- Other things your show could have...

- Lonely Hearts Adverts

- Psychic/Horoscopes

- A quiz/competition

- Mystery Noise

- Pet's corner

- Agony aunt

Student Companion Worksheet – Radio Show

Sample Show Plan

Time (minutes)	Segment	Talking
00.00-00.10	Jingle	All
00.10-00.40	Weather Report	Martin King
00.40-01.40	Movie Review	Movie-Mike
01.40-02.40	Agony Aunt	Ask Alice
02.40-03.40	Jingle	All
03.40-04.40	Special Report	Ron Burgundy
04.40-05.00	Top ten hits	DJ Bridge21
05.00-05.10	Jingle	All

Student Companion Worksheet – Radio Show

Show Planning Template

Time (minutes)	Segment	Talking

Sample Presentation Assessment Rubric

Category	Scoring Criteria	Total Points	Score
Organization (15 points)	The presentation is appropriate for the topic and audience.	5	
	Information is presented in an order that makes sense.	5	
	Clearly say where they got their information.	5	
Content (45 points)	Has a good introduction that gets your attention, lays out the problem well, and lets you know where the presentation is going.	5	
	Language is easy to understand.	5	
	Presentation contains accurate information.	10	
	Material included is relevant to the topic.	10	
	The poster has a strong clear message.	10	
	The presentation offers a potential solution.	5	
Presentation (40 points)	Each Speaker maintains good eye contact with the audience and is appropriately animated (e.g., gestures, moving around, etc.).	5	
	Speakers use a clear, audible voice.	5	
	Each member of the team contributed to the presentation.	10	
	Visual aids are well prepared, appropriate, and not distracting.	5	
	Length of presentation is within the assigned time limits.	5	
	Information was well communicated.	10	
	Total Points	**100**	
Score			

Individual Reflection Sheet

Has the workshop impacted on you in any of the following ways?

	Never	Only now & again	Sometimes	Nearly always	Always
I enjoyed working with my team					
I did not contribute to my team's ideas and work					
I trusted my teammates					
I had a clear role to play in my team					
I didn't help my teammates when they needed it					
I got on well with my teammates					
I was bossy with some teammates					
I made a good contribution to my team					
I listened to my teammates' ideas					
I liked working with my team					

How well did you work with your team during the workshop?

	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
Improved my ability to work with others					
Developed my research skills					
Increased my confidence using technology					
Allowed me to make new friends					
Improved my communication skills					
Allowed me to be creative					
Helped me learn and explore new topics and information					

Individual Reflection Sheet

Two things I did well this time:

1.

2.

One thing I would like to improve next time:

1.

Research

1. Research associated with the TfT Approach

2. Useful background reading

Research Associated with the TfT Approach

Publications associated with TfT and Bridge21

The Teaching for Tomorrow project has its foundations in a pedagogical model known as Bridge21 (www.bridge21.ie). Conceived of in 2007, Bridge21 is a project designed to support the development of an innovative 21st century learning environment in 2nd level schools in Ireland. Bridge21 has a strong history of published research, including the following.

1. We'll add a list of the most relevant publications here, but for now go to www.bridge21.ie/resources.

Useful Background Reading

Useful Background Reading

In addition to the publications, there are a number of European reports that were influential in the design of the TfT approach. These include:

1. Primas
2. Macsil

The Bridge21 methodology has its foundations in the World Organisation of the Scout Movement, and the Activity Design Template was inspired by the design thinking movement that began in the d.school in Stanford.

Useful Resources

Teaching for Tomorrow aims to keep up to date with developments in the fields of inquiry-based learning, project-based learning, technology-enhanced education and 21st Century Learning. Up-to-date research and resources are provided on our twitter feed - @teachingfor2mrw – and on our Facebook page - www.facebook.com/Teachingfor2mrw/.