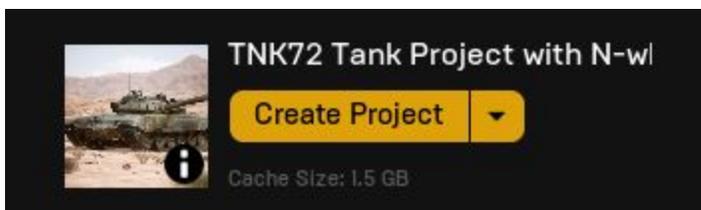


## Project Structure

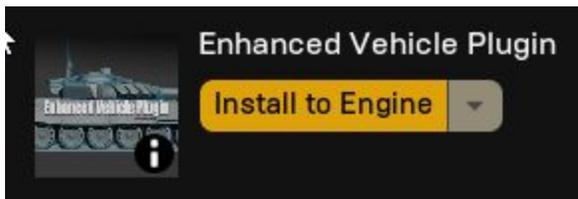
Our Vehicle Asset packs come as a Complete Project from the marketplace. The reason for this is so purchasers can easily see a fully working vehicle, with all the inputs and settings correctly configured. From this project, the vehicles can easily be migrated to other projects, and the correct inputs and project configurations can be copied over. Instructions on how to migrate, and the required setup for use in your own projects is below.

## Installation

To install the vehicle from the Epic Games launcher, simply click, Create Project:



Then install the Enhanced Vehicle Plugin to the Engine:



**Important: This project requires the free OWIEnhancedVehicleMovement plugin to be added to the engine or project before it can be used.** You can download it from the marketplace here:

<https://www.unrealengine.com/marketplace/en-US/slug/enhanced-vehicle-plugin>

Installation instructions can be found on the plugin page.

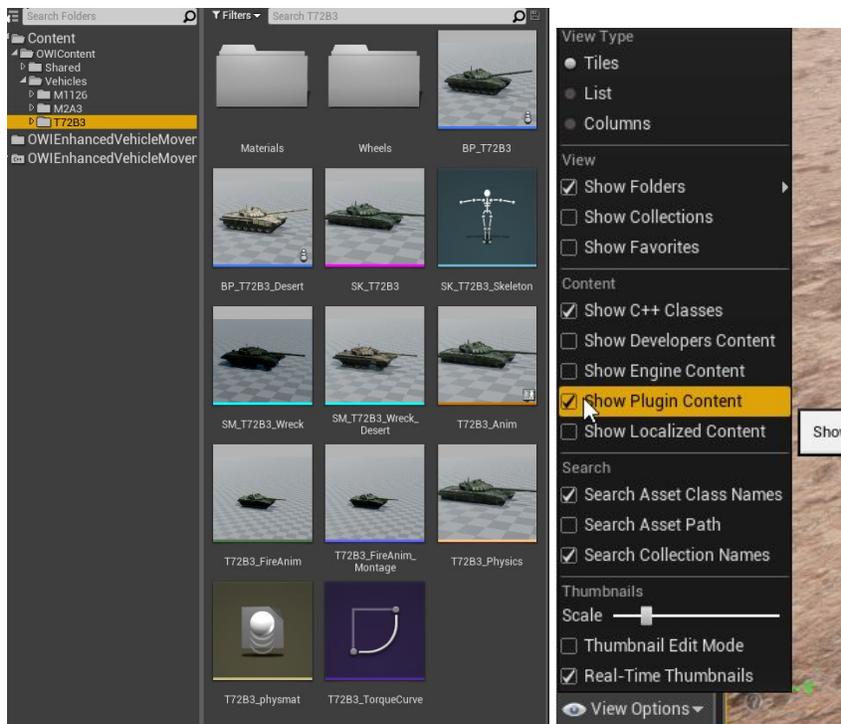
The plugin will be installed by the Epic Games Launcher to the Engine Plugins folder, usually located at C:\Program Files\Epic Games\UE\_4.23\Engine\Plugins\Marketplace.

If you would like to use it as a Project plugin, rather than an engine plugin, install it to the engine as above, and then copy the folder from your engine marketplace folder, to your project Plugins folder, shown below.

Name	Date modified	Type	Size
Config	2019-09-19 3:56 PM	File folder	
Content	2019-09-19 1:57 PM	File folder	
Intermediate	2019-10-02 3:48 PM	File folder	
Plugins	2019-10-02 3:47 PM	File folder	
Saved	2019-09-24 10:58 AM	File folder	
TNK72	2019-09-19 1:56 PM	Unreal Engine Proj...	1 KB

If there is no plugins folder in your project, create one. Now, when opening your project, Unreal will use the plugin located in your project folder, for this project only. You may then wish to delete the Engine plugin, if you do not wish to use it in all your projects.

Upon opening, the project is contained in an overall OWIContent Folder. Inside this there are folders for the vehicles, and a shared folder. The shared folder consists of assets to be shared by all OWI vehicles, from the master vehicle parent blueprint, to common fx shared by all military vehicles, as well as the demo map.



Below that is the free OWI Enhanced Vehicle Movement Plugin which is required for the vehicles to work, and will need to be added to any projects using these vehicles. You may need

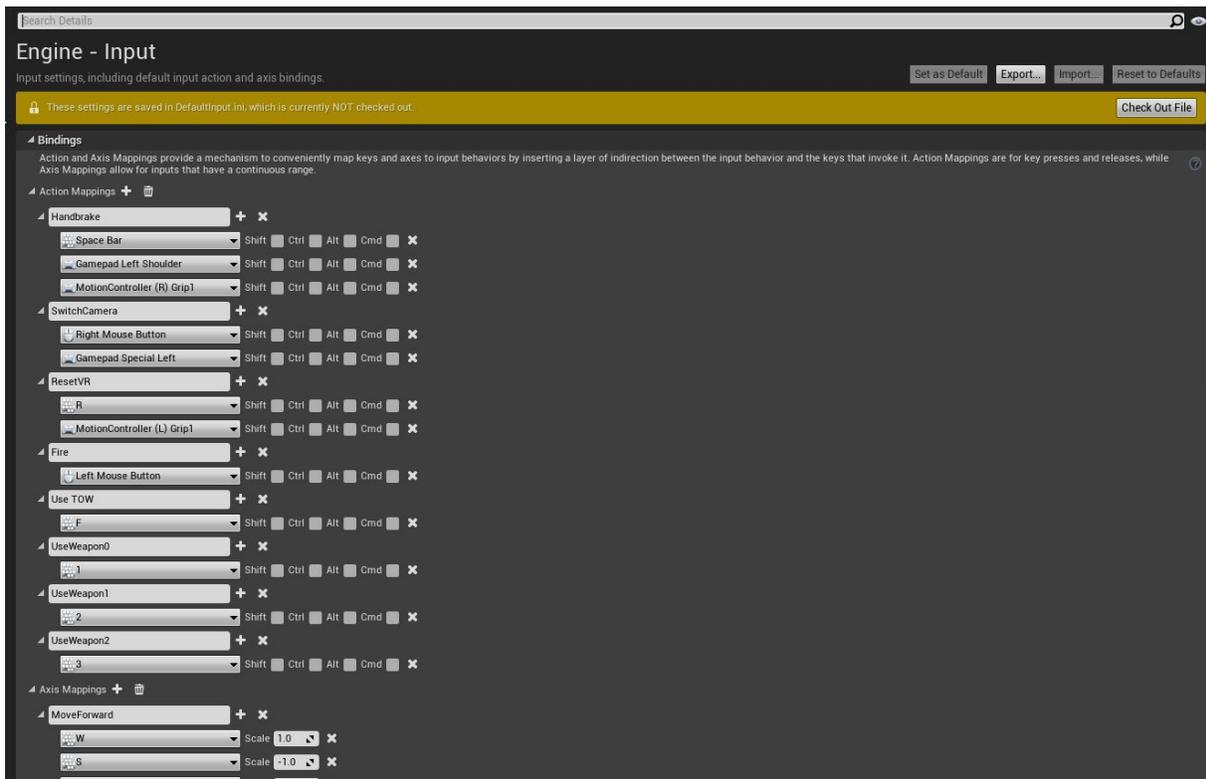
to check the 'Show Plugin Content' in the view options at the bottom of the content browser. Instructions on downloading and installing the plugin can be found above.

## Project Configuration

The vehicle project is already configured to work correctly, but setting these inputs and project configurations are very important if migrating the vehicle to another existing project.

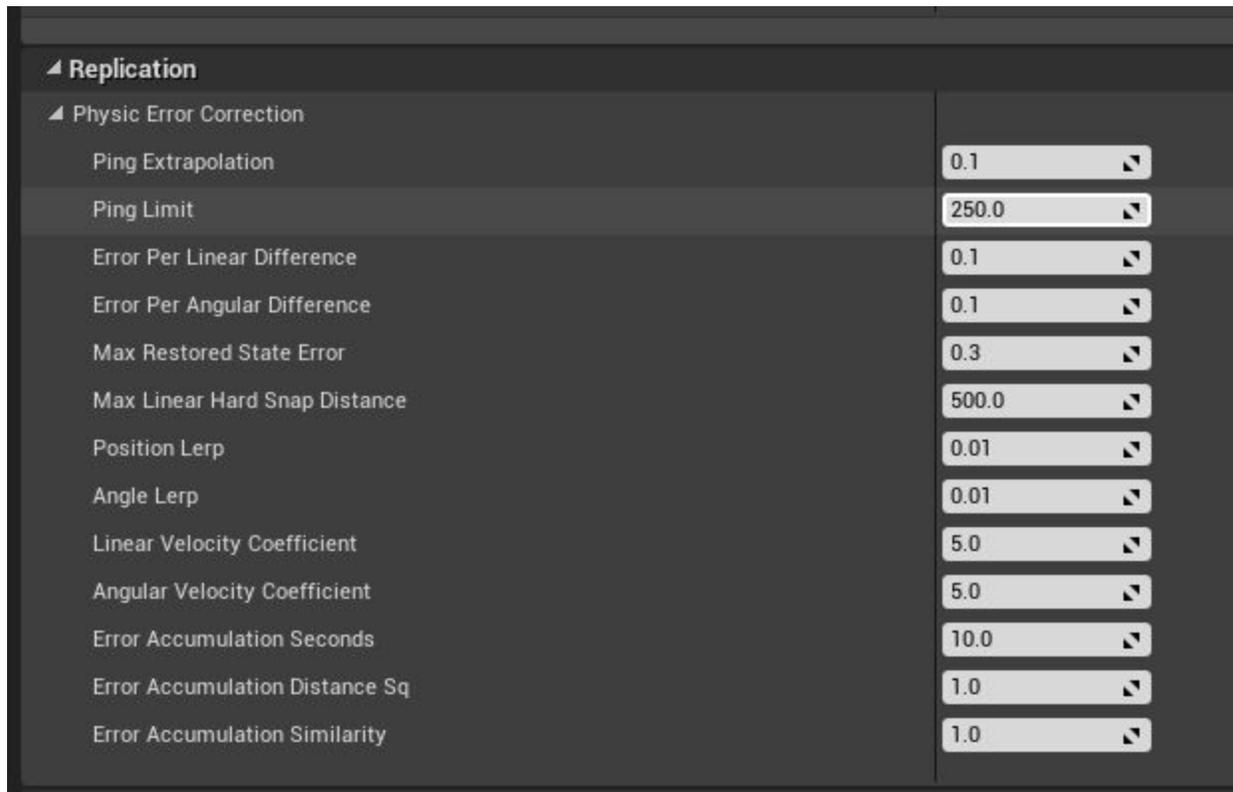
### Input

Steering and vehicle control Inputs are already set up in the example project, and can be found at Edit/project Settings/Input in the editor. The control inputs need to be added in the input section of your project if migrating to new projects. These can also be exported using the button on the top right, and imported into your new project settings.



In order for the vehicles to move smoothly, we recommend you use the following values in the *Engine* → *Physics* section of your project settings. This will need to be set u in any new projects you migrate vehicles to.

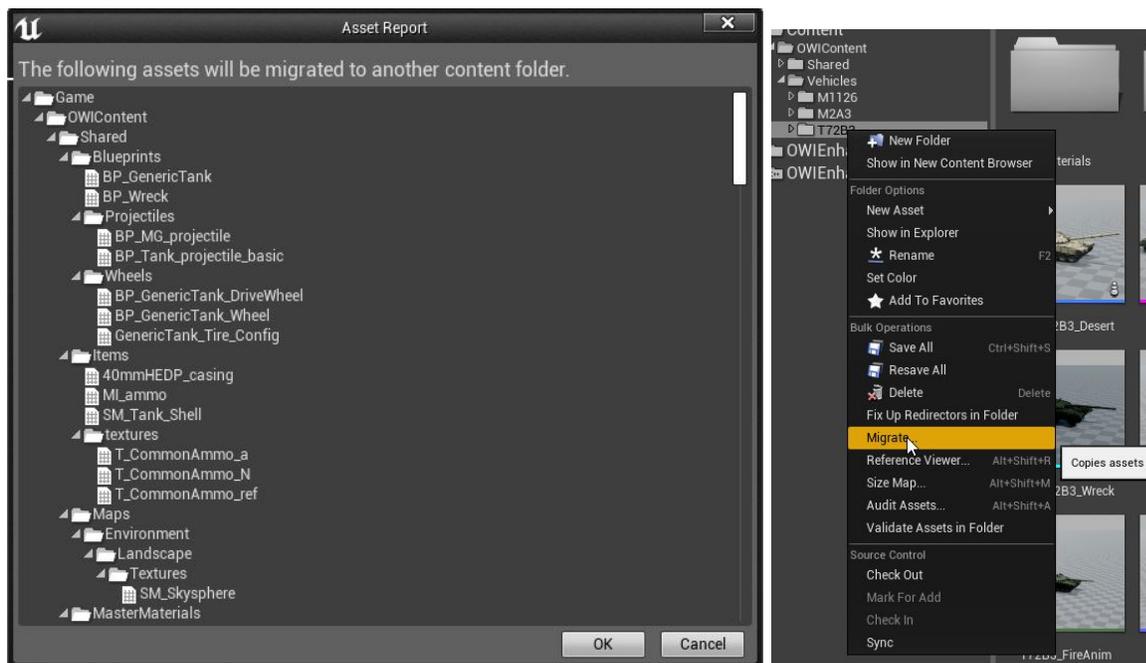
...via project settings dialog



Replication	
Physic Error Correction	
Ping Extrapolation	0.1
Ping Limit	250.0
Error Per Linear Difference	0.1
Error Per Angular Difference	0.1
Max Restored State Error	0.3
Max Linear Hard Snap Distance	500.0
Position Lerp	0.01
Angle Lerp	0.01
Linear Velocity Coefficient	5.0
Angular Velocity Coefficient	5.0
Error Accumulation Seconds	10.0
Error Accumulation Distance Sq	1.0
Error Accumulation Similarity	1.0

## Migrating Vehicles to other projects

Vehicles can be migrated to use in other projects by right clicking the Vehicle folder, and selecting migrate. A list of the required assets to migrate will appear, such as textures, weapons effects etc, and they will appear in the new project under the same folder structure used in the example project. **The OWIEnhancedVehicleMovement plugin will also need to be added to the plugins directory of any projects the vehicles are migrated to, if not installed as an engine plugin**



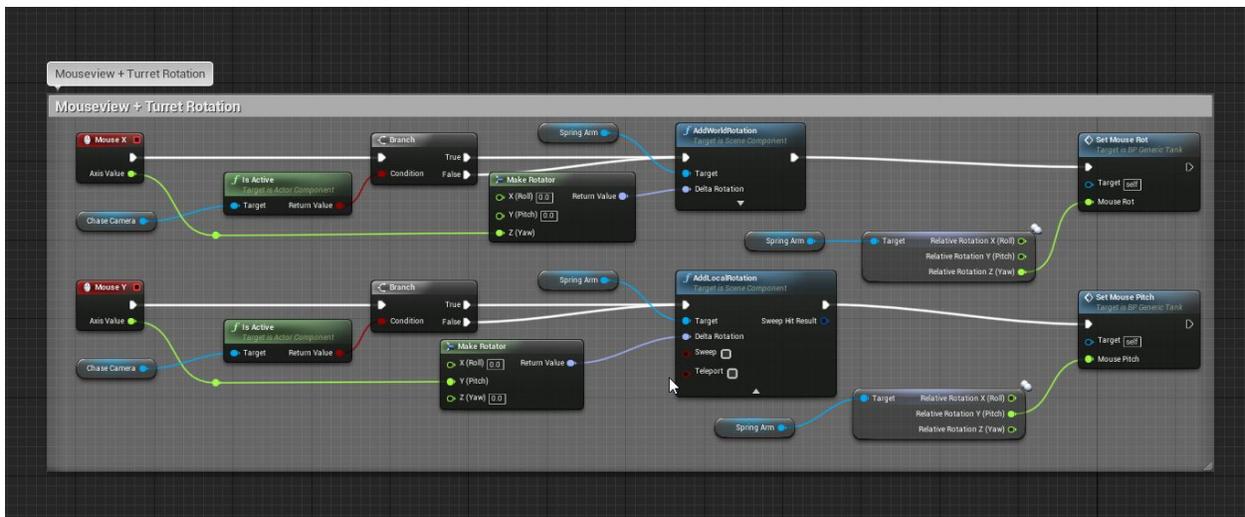
The folders can then be moved to where they are required in a new project hierarchy, but particular attention should be paid to fixing up redirectors, and if on a project with source control, folders should be moved with source control **on** in the editor, so the folder moves and redirectors are done cleanly. If in doubt, keeping everything in the OWIContent folder should be safe.

# Vehicle Setup

Vehicles are created either as Child Objects from the BP\_GenericTank Blueprint for tracked vehicles, or BP\_GenericAPC for multiwheeled vehicles. The main vehicle system is designed here, with parameter slots that can be set in the child BPs. Components designed for use with all child vehicles, such as lights, vehicle dust and smoke are all added here, but can be set up in the child BPs, as seen in the vehicle setups, with the vehicle being the child of BP\_GenericTank.

# Turret

Turret control is setup here, with mouse input setting parameters, which are then accessed in the vehicle AnimBP, and use to rotate bones on the vehicle.





**▲ Mechanical Setup**

▲ Engine Setup

▷ Torque Curve

RPM	Torque
0.00	2048.00
512.00	~3000.00
1024.00	4096.00
1536.00	~3500.00
2048.00	0.00

Max RPM: 2300.0

MOI: 1.0

Damping Rate Full Throttle: 0.1

Damping Rate Zero Throttle Clutch Er: 5.0

Damping Rate Zero Throttle Clutch Di: 5.0

▷ Transmission Setup

**▲ Vehicle Setup**

Deprecated Spring Offset Mode:

Reverse as Brake:

Mass: 30000.0

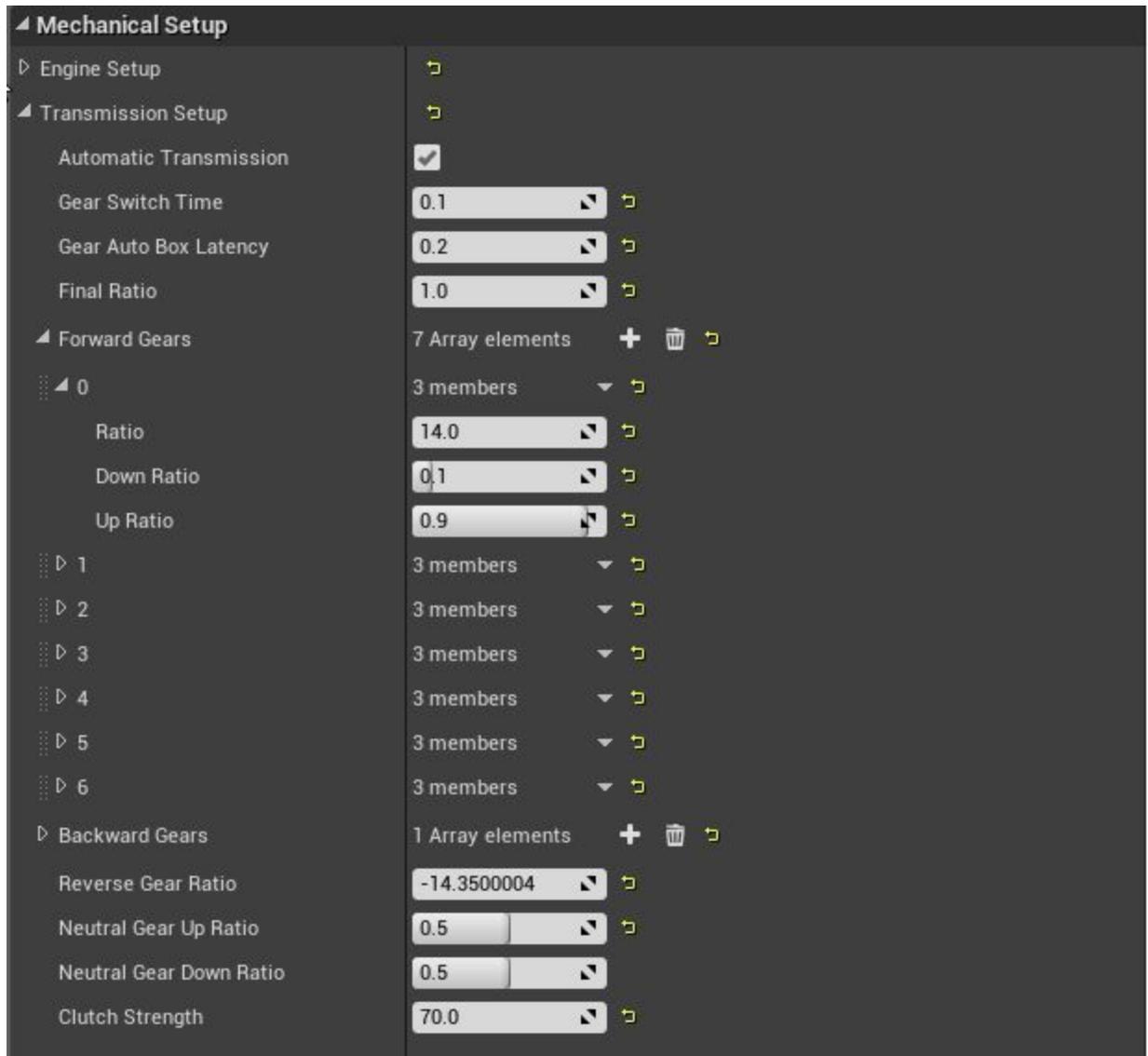
▷ Wheel Setups: 16 Array elements + -

Drag Coefficient: 0.3

Chassis Width: 180.0

Chassis Height: 140.0

Next is the gearbox, where the number of gears can be set, and gear ratios adjusted. A particular parameter to note is the up ratio per gear. This is the percentage of max RPM per gear (rounded to between 0 and 1) so, with a max RPM of 2300, an up ratio of 0.9 will shift gear up at 90% of that max ratio. Beware when setting high max RPMs and high Up Ratios (example 0.9 or 90%), that if you don't have the power and torque in your power curve to get to 90% of that RPM, the gear will never shift up.



Finally, the wheels are set up as follows, for both tanks and wheeled vehicles: Tanks will need to use a wheel with BP\_GenericTankWheel as its parent, multiwheeled vehicles can just use a normal UE4 VehicleWheel. The bone for each wheel is assigned as below, and the size and shape of the wheels are defined in its blueprint properties. These should be adjusted to match the visual wheels

**Vehicle Setup**

Deprecated Spring Offset Mode

Reverse as Brake

Mass

**Wheel Setups** 16 Array elements +

**0** 4 members

Wheel Class

Bone Name

Additional Offset X  Y  Z

Disable Steering

**1** 4 members

Wheel Class

Bone Name

Additional Offset X  Y  Z

Disable Steering

**2** 4 members

Wheel Class

Bone Name

Additional Offset X  Y  Z

Disable Steering

**3** 4 members

Wheel Class

Bone Name

Additional Offset X  Y  Z

Disable Steering

**4** 4 members

Wheel Class

Bone Name

Additional Offset X  Y  Z

Disable Steering

**5** 4 members

**6** 4 members

**7** 4 members

**8** 4 members

**9** 4 members

**10** 4 members

**11** 4 members

**12** 4 members

**13** 4 members