Babel JavaScript compiler CLI

START HERE

`npm i -D @babel/core @babel/cli`
Install locally

`npx babel <file>`
Compile to stdout

`npx babel <file> -o <out>`
Compile to a file

`npx babel src -d lib`
Compile a directory

`npx babel src -d lib -w`
Rebuild on change

`npx babel src -d lib -s`
Write source maps

`npx babel src -d lib --presets <p>`
Pick presets

`npx babel src -d lib -D`
Copy non-JS files too

Source modern JS, JSX, TS → parse → **Plugins** transform syntax → grouped by → **Presets** env, react, typescript → generate → **Output** plus source map

CONCEPTS

Install @babel/cli and @babel/core in the project. Without them npx may fetch an ancient Babel 6 'babel'.

Babel only transforms syntax. It does not type-check TypeScript and does not bundle modules.

Pass plugin and preset names without the prefix: env means @babel/preset-env.

INPUT AND OUTPUT

`babel <file>`
Compile one file to stdout

`babel <file> -o <out>`
Compile one file into a file
--out-file; with several inputs they are concatenated into the one file.

`babel <dir> -d <outdir>`
Compile a directory tree
--out-dir; keeps the folder structure and writes .js files.

`babel <a> <b> -d <outdir>`
Compile several files or dirs

`babel <dir> -o <out>`
Concatenate a dir into one file

`babel -f <name> < <in> > <out>`
Compile stdin
--filename tells Babel the name, so config overrides and errors work.

`babel <dir> -d <outdir> --relative`
Output relative to each input

`babel <dir> -d <outdir> --delete-dir-on-start`
Clean the output dir first

`babel <dir> -d <outdir> -D`
Copy non-compilable files
--copy-files; ignored JS files are copied too unless --no-copy-ignored.

`babel <dir> -d <outdir> --no-copy-ignored`
Skip ignored files when copying

`babel <dir> -d <outdir> --include-dotfiles`
Include dotfiles

SELECTING FILES

`babel <dir> -d <outdir> -x .ts,.tsx,.js`
Compile these extensions
--extensions applies only when the input is a directory.

`babel <dir> -d <outdir> --ignore "<glob>"`
Skip files matching a glob

`babel <dir> -d <outdir> --ignore "<dir>/**/*.test.js"`
Skip test files

`babel <dir> -d <outdir> --only "<glob>"`
Compile only matching files

`babel <dir> -d <outdir> --keep-file-extension`
Keep input extensions

`babel <dir> -d <outdir> --out-file-extension .mjs`
Set the output extension

`babel <dir> -d <outdir> --source-type module`
Treat input as ES modules

PRESETS AND PLUGINS

`babel <file> --presets @babel/preset-env`
Use a preset

`babel <file> --presets env,react`
Several presets, comma-separated

`babel <file> --plugins <plugin>`
Use a plugin

`babel <file> --presets @babel/preset-typescript -x .ts`
Strip TypeScript types

`babel <file> --presets @babel/preset-react`
Compile JSX

`babel <file> --env-name <name>`
Pick the env block from the config
Defaults to BABEL_ENV, else NODE_ENV, else development.

`BABEL_ENV=production babel <dir> -d <outdir>`
Select the production env

CONFIG FILES

`babel <file> --config-file <path>`
Use a specific config file

`babel <file> --no-babelrc`
Ignore .babelrc files
babel.config. is still read; this skips only file-relative configs.*

`babel <file> --root-mode upward`
Find babel.config.* in a parent dir
For monorepos where the config sits at the repo root.

Config file kinds

File	Scope
`babel.config.json`	Project-wide; also covers node_modules
`.babelrc.json`	Per package; applies to files below it
`package.json 'babel'`	Same as .babelrc

babel.config.json

```
{
  "presets": [
    ["@babel/preset-env",
{ "targets": "defaults" }]
  ]
}
```

Targets decide how much preset-env rewrites. Set them in the config or a browserslist file.

WATCH AND OUTPUT CONTROL

`babel <dir> -d <outdir> -w`
Recompile on change
--watch; compiles everything once first.

`babel <dir> -d <outdir> -w --skip-initial-build`
Watch without the first build

`babel <dir> -d <outdir> --verbose`
Log every file

`babel <dir> -d <outdir> --quiet`
Print nothing

`babel <file> --no-comments`
Strip comments

`babel <file> --minified`
Minify the output

`babel <file> --compact true`
Drop extra whitespace

`babel <file> --retain-lines`
Keep original line numbers

SOURCE MAPS

`babel <dir> -d <outdir> -s`
Write .map files

`babel <dir> -d <outdir> -s inline`
Embed the map in the output

`babel <dir> -d <outdir> -s both`
Inline and separate map

PACKAGE SCRIPTS

package.json scripts

```
"scripts": {
  "build": "babel src -d lib -s",
  "dev": "babel src -d lib -w"
}
```

`npx babel --version`
Show CLI and core versions

`npx babel --help`
List all options

`babel-external-helpers`
Print the shared helpers file
A second binary in @babel/cli; use with the external-helpers setup.

Babel CLI ignores node_modules by default. Add dependencies to the build only through a bundler.

RECIPES

Library build

```
# one-time setup
npm i -D @babel/core @babel/cli @babel/preset-env
echo '{"presets":["@babel/preset-env"]}' > babel.config.json
npx babel src -d lib -s --ignore "src/**/*.test.js"
```

Watch and copy assets

```
npx babel src -d dist -D -w
```

TypeScript sources, no type check

```
npm i -D @babel/preset-typescript
npx babel src -d dist -x .ts,.tsx --presets @babel/preset-typescript
npx tsc --noEmit
```

Per-env build

```
BABEL_ENV=production npx babel src -d dist --delete-dir-on-start --no-comments
```