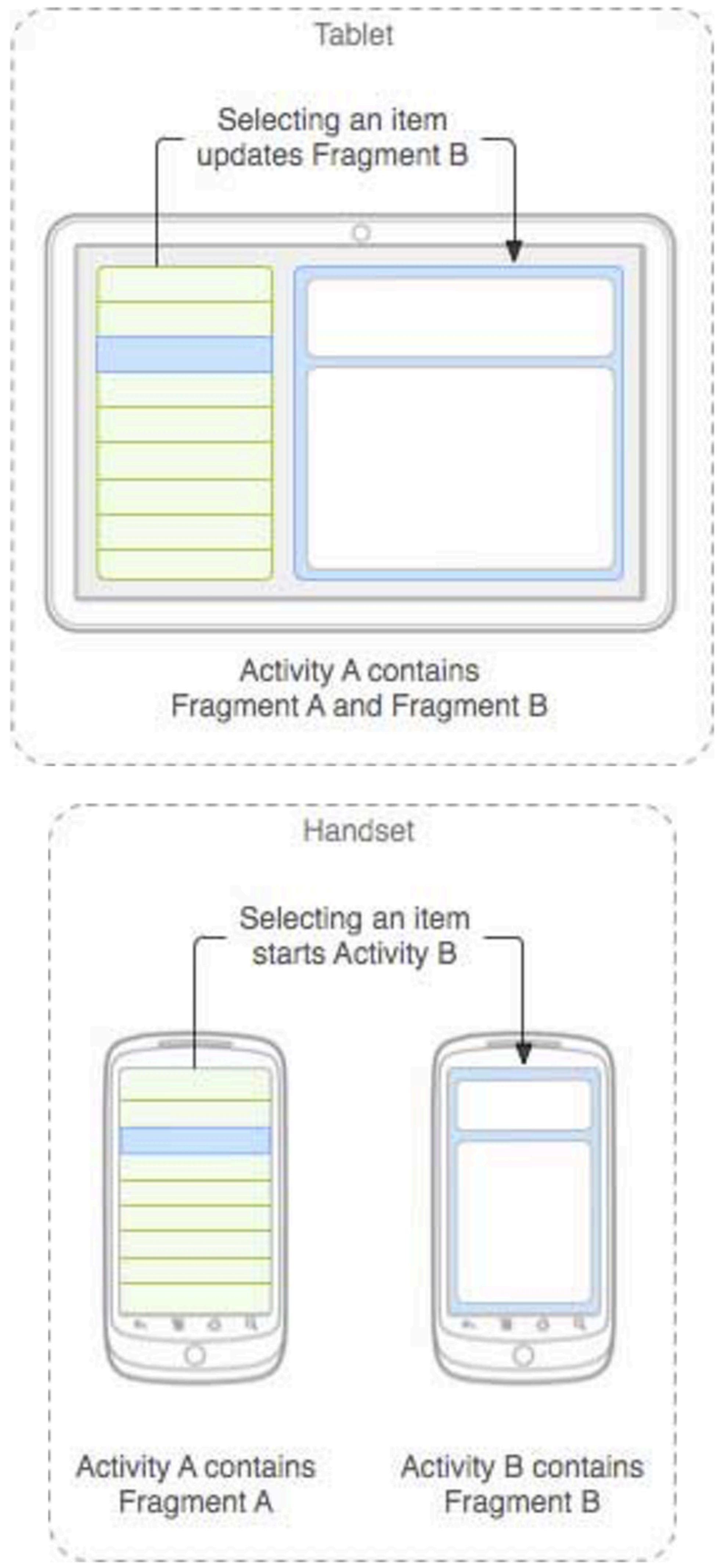

Tablet
Selecting an item updates Fragment B
Activity A contains Fragment A and Fragment B
Handset
Selecting an item starts Activity B
Activity A contains Fragment A
Activity B contains Fragment B

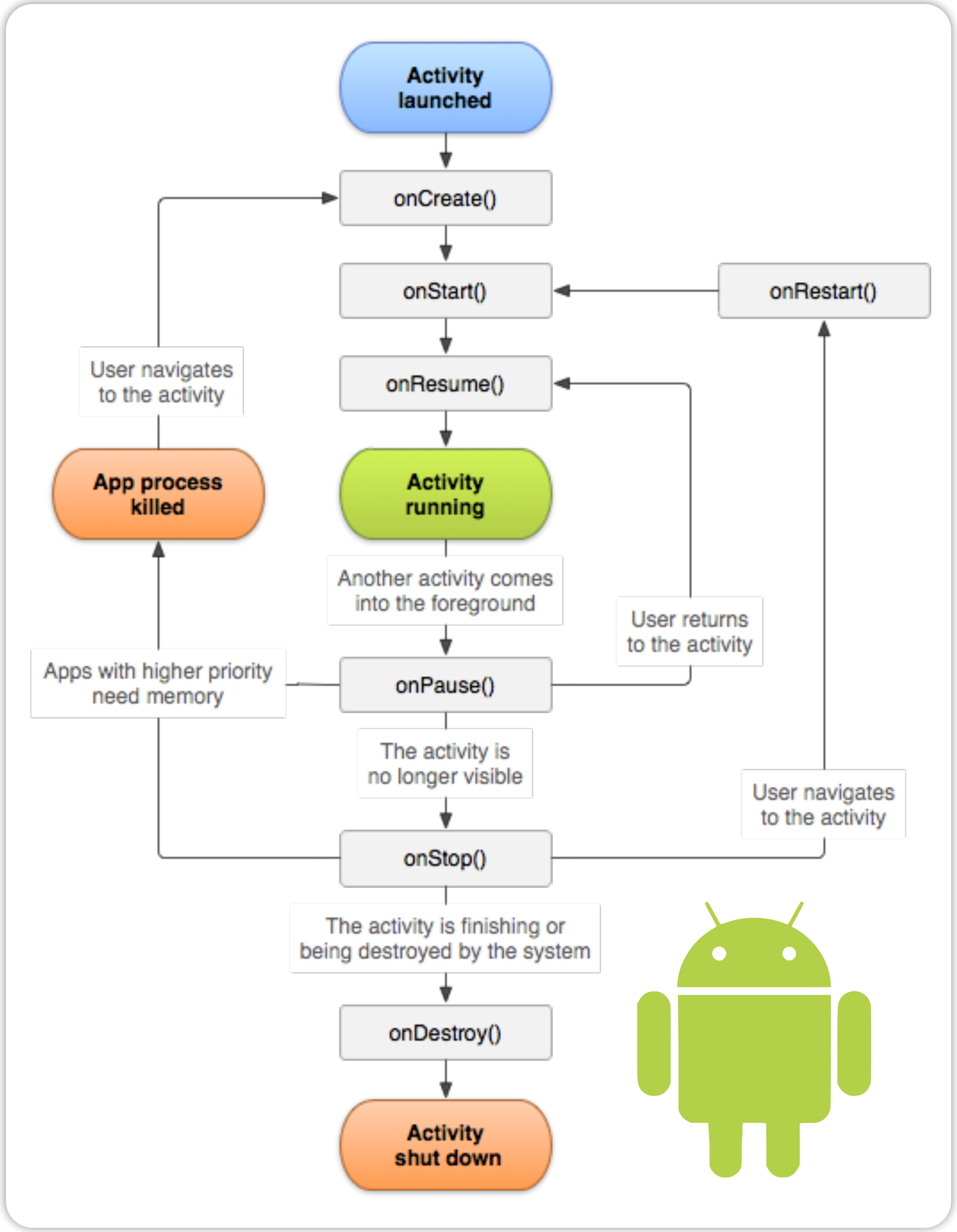
MOBILE APPLICATION DEVELOPMENT

ANDROID (2017)

LECTURE 11: FRAGMENTS

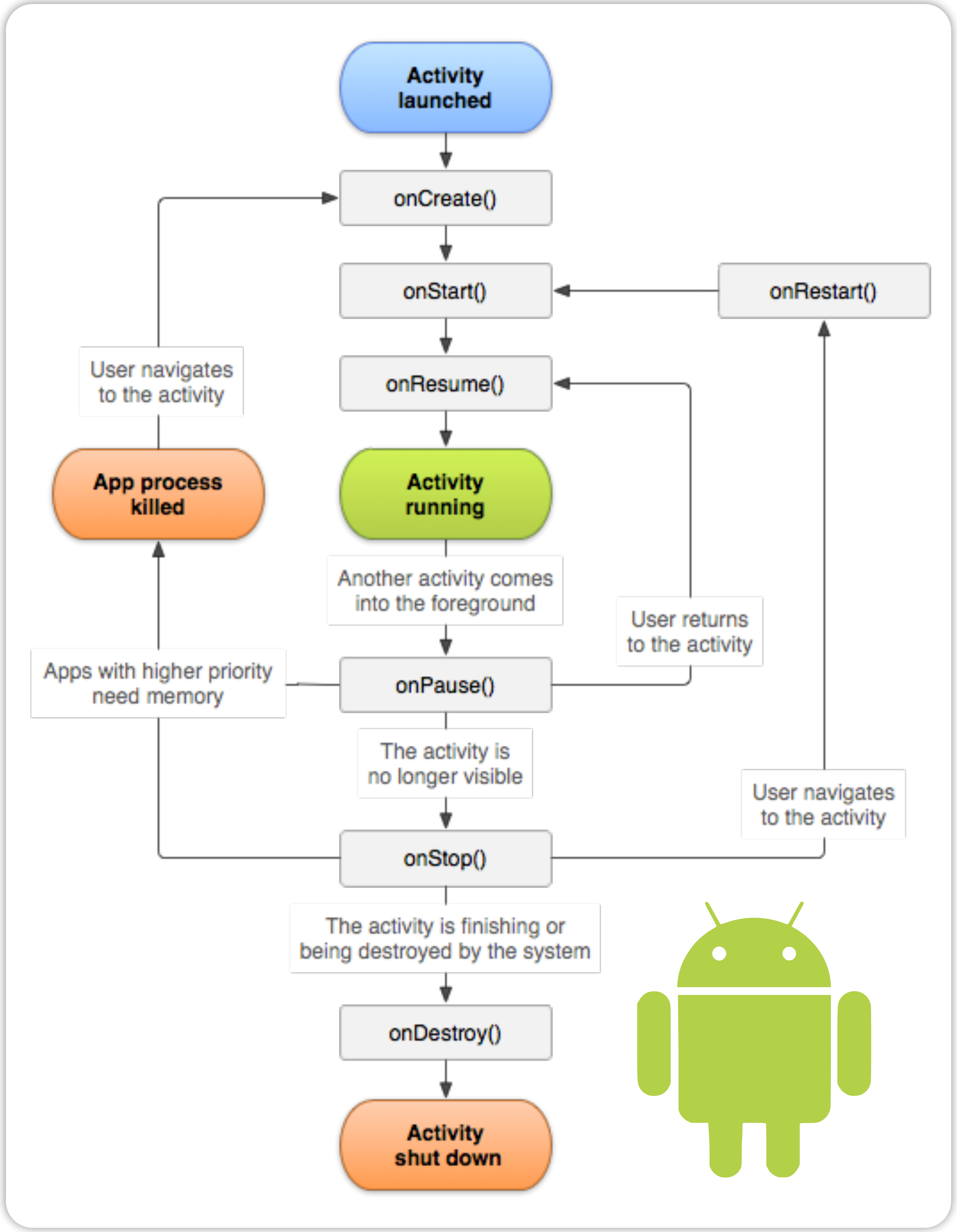
ACTIVITY REVIEW

- Most applications are composed of Activities.
- Activities manage application state and move through many phases of a lifecycle.
  - Lifecycle methods address the creation, pause/resuming, and destruction of Activites within an application.
  - Many of these events are initiated by the system in response to events outside the affected Activity.


Activity launched
onCreate()
onStart()
onRestart()
User navigates to the activity
onResume()
App process killed
Activity running
Another activity comes into the foreground
User returns to the activity
Apps with higher priority need memory
onPause()
The activity is no longer visible
User navigates to the activity
onStop()
The activity is finishing or being destroyed by the system
onDestroy()
Activity shut down

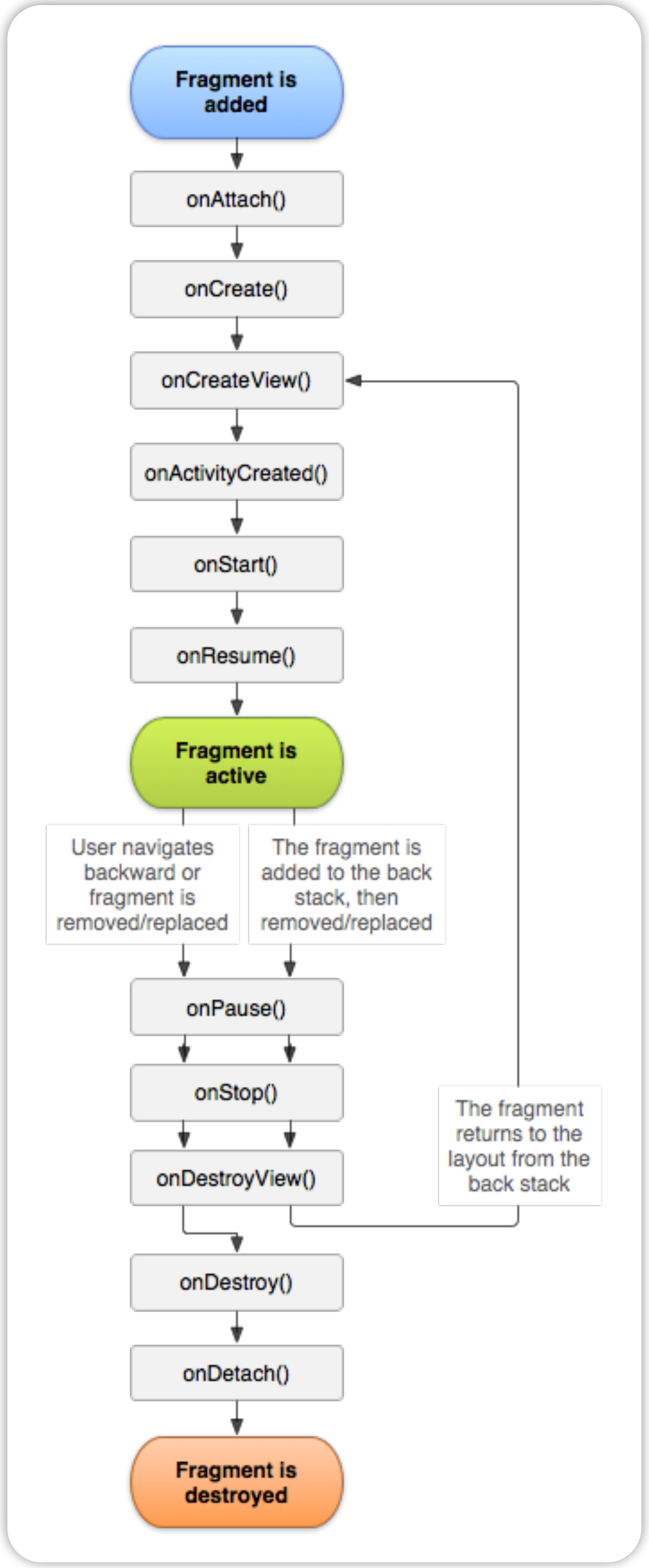
ACTIVITY CONCERNS

- Activities are fairly complex, and manage a large amount of associated state.
- Activities are destroyed and re-created in response to a number of events.
- Activities cannot co-exist on the same screen (an Activity is a single screen of information).


Activity launched
onCreate()
onStart()
onRestart()
User navigates to the activity
onResume()
App process killed
Activity running
Another activity comes into the foreground
User returns to the activity
Apps with higher priority need memory
onPause()
The activity is no longer visible
User navigates to the activity
onStop()
The activity is finishing or being destroyed by the system
onDestroy()
Activity shut down

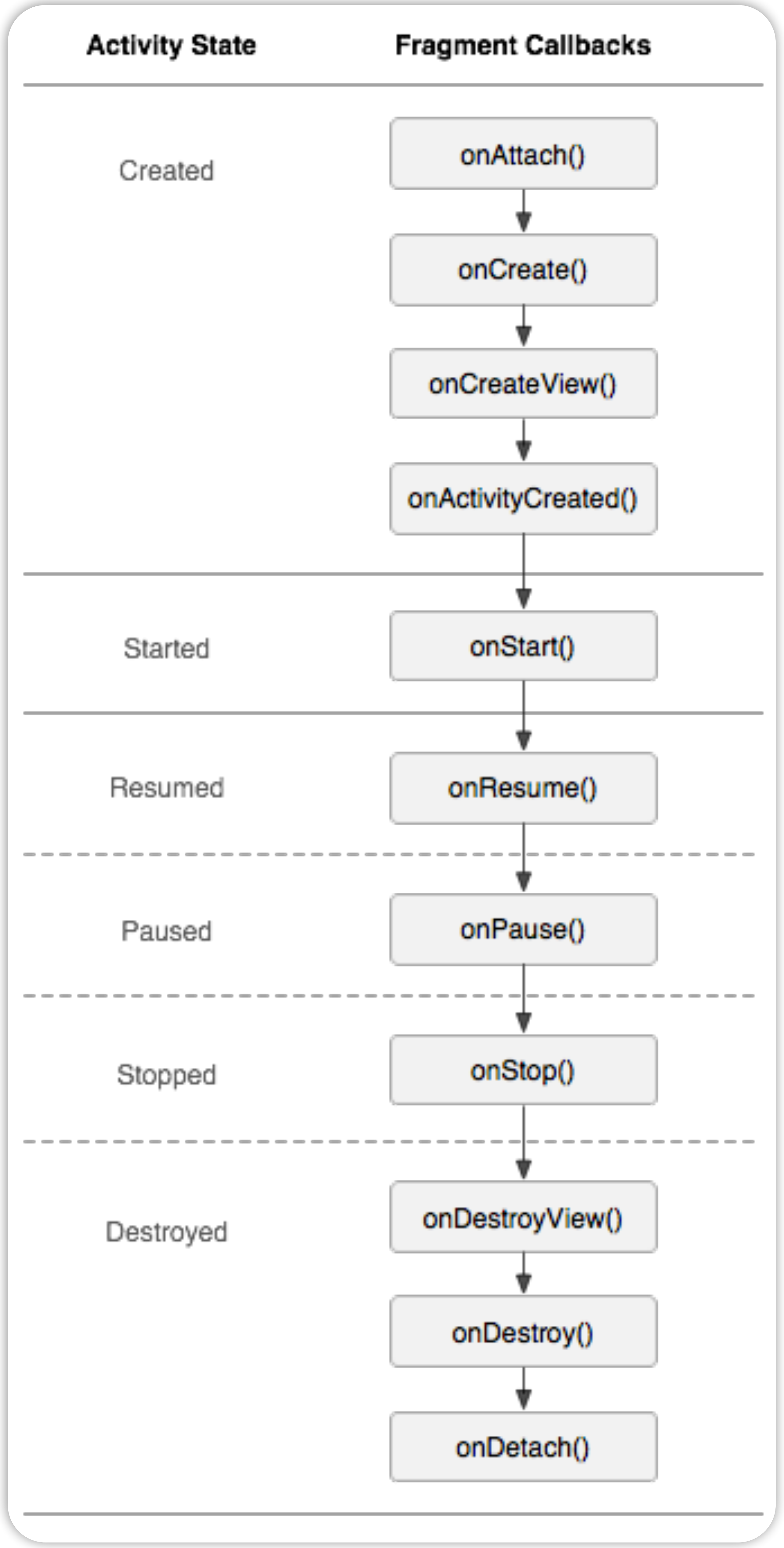
FRAGMENTS

- Fragments are essentially sub-Activities which can be added and removed to an Activity to help organize applications into smaller functional units.
- Fragments share many of the lifecycle methods of Activities, but add a few more of their own (such as `onCreateView()`).
- An Activity can add or remove multiple Fragments to itself using a FragmentManager and either one or many FragmentTransactions.
- Fragments are not destroyed as often as Activities.



FRAGMENT/ACTIVITY RELATIONSHIP

- Fragments are closely tied to the lifecycle of their Activity.
- Fragments are created along with their Activity and are destroyed at the same time.
- A FragmentManager may hold onto Fragments even during screen rotations so long as the parent Activity has not called `finish()` (which always destroys the Activity).
- Fragments should establish listener relationships with their parent in `onAttach()` and remove the relationships in `onDetach()`.



THE BACK STACK

- Android supports a system-wide back button which can be used to reverse many navigation actions.
- FragmentTransactions are not added to the back stack by default, so custom transitions between Fragments which rely on the back stack must manually ensure that the FragmentTransaction involves a call to `addToBackStack()`.
- It is not mandatory for the programmer to support back behavior in any specific way, but attempting to fit in with traditional Android behavior will help users understand what your app is doing in response to their actions.